



# CANADIAN NAVAL REVIEW

VOLUME 12, NUMBER 4 (2017)

## **Special Issue: Recapitalizing the Fleet**

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**Some Observations on  
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Building Warships**

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# CANADIAN NAVAL REVIEW

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*Canadian Naval Review* is published by the CFPS/CSSD at Dalhousie University. It is a professional journal examining a wide range of maritime security issues from a Canadian perspective. In particular it focuses on strategic concepts, policies, operations, history and procurement of the Canadian Navy, plus national security in general and marine/ocean affairs. This initiative brings together members of the Canadian defence and academic communities and is a component of the Centre's Maritime Security Program.

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- provide a public forum for the discussion of Canada's naval and maritime policies; and
- provide a source for the public examination of Canadian naval and maritime history and for the development of lessons learned.

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Credit: Cpl Chris Gray, DND



HMCS *Charlottetown* flies her Battle Ensign as she sails west in the Mediterranean Sea during *Operation Reassurance*, 23 December 2016.

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# Editorial

## Recapitalizing the Fleet

The Centre for the Study of Security and Development (formerly the Centre for Foreign Policy Studies) which publishes *Canadian Naval Review* has a long history of working with other groups to expand the public debate on maritime security. The Naval Association of Canada's fall conference, "Recapitalising the Fleets of the Government of Canada," presented another opportunity to do so. I was able to attend this conference and was struck with the quality of the speakers. They all looked beyond the immediate shipbuilding projects to assess the Royal Canadian Navy (RCN) and Canadian Coast Guard's long-term needs and what would be required to meet them. As a result of this tight focus, *CNR* reviewed the conference program and selected the five presentations most suited for publication here.<sup>1</sup> *CNR* then came to an agreement with the Naval Association's executive that permitted NAC to sponsor this issue.

The first article, by Michael Hennessy of the Royal Military College of Canada, addresses Canadian shipbuilding history. It is an excellent condensed history of Canadian naval shipbuilding focused at the strategic level. Hennessy stresses that in the past the RCN suffered politically damaging cost overruns as a result of either cutting steel before the design was fixed or as a result of frequent changes in operational requirements during the build. He notes the improvements in these areas with each successive class and with the overall government project management system. However, he makes clear that national shipbuilding is an immense task involving billions of dollars spread over decades, and all of this requires the most intensive cooperation among government, the navy and industry. This was a key lesson and one we will see repeated.

In the next article, Tom Ring, former Assistant Deputy Minister Acquisitions for Public Services and Procurement Canada, provides insights on the origins of the National Shipbuilding Strategy (NSS) and follows this with some

strong recommendations for what will be required to keep it on track. He makes it clear that the success of the NSS in reinvigorating the East and West Coast shipyards rested on officials and experts within industry, Public Works and Government Services Canada, Industry Canada, the Department of National Defence, the RCN, the Privy Council Office, Treasury Board and Department of Finance working in close collaboration. Not surprisingly, over time much of the original team that built the strategy has moved on, and some of today's key players are returning to their departmental silos and may be unwilling to make the sacrifices full cooperation requires. In complete agreement with Hennessy, Ring argues this collaboration must continue for the NSS to succeed, and he strongly advocates a form of 'relational contracting' to achieve this. There is, he concludes, also a recent, return to political involvement in the tactical issues of defence procurement, with little of this being good.

Elinor Sloan, a professor of international relations at Carleton University, begins with an examination of the maritime security threats that Canada faces from the competition between major powers, lawlessness in the littoral regions, and challenges to Arctic interests. She then focuses on what the NSS must do to address these challenges. She argues that this would include a plan to replace Canada's diesel-electric submarines after their scheduled life expires in the 2027-30 period. Further, she argues that Canada's successful *Halifax*-class Modernization Project must be followed with an anti-submarine warfare upgrade in the frigates, as the number of submarines continues to grow in the Indo-Pacific region. In addition, she argues that two Joint Support Ships are inadequate and at least one more must be added, Canada should start considering a specific humanitarian assistance/disaster response ship, and Canada should build capacity to operate in the increasingly important littoral regions. In her view, the Arctic/Offshore Patrol Ships (AOPS) will prove extremely



Credit: Airbus/Skies Magazine

Some recapitalization of the Canadian military has begun. On 8 December 2016, Ottawa announced that the Airbus C295W had been selected as the winner in the fixed-wing search and rescue aircraft competition.



To continue a proud RCN history, the National Shipbuilding Strategy needs to succeed. The Canadian frigate HMCS *Vancouver* (CPF 331) steams alongside USS *John C. Stennis* upon their return from deployment in support of Operation *Enduring Freedom*, 20 May 2002.

useful vessels, and the NSS should be considering a form of AOPS II after the Canadian Surface Combatants are built. Only by identifying the elements of NSS Part Two now will we be able to ensure the strategy moves beyond Canada's historical boom-and-bust shipbuilding cycles and addresses the emerging security challenges. There is an obvious need to communicate these long-term requirements.

Michael Byers, who teaches global politics and law at the University of British Columbia, provides a sustained challenge to the current RCN submarine fleet arguing that the principle of 'sunk costs' has prevented Canada from eliminating them and moving on to a more cost-effective variant. He outlines the problems that Canada has had with the submarines purchased from Britain, but also points out that this is not a problem unique to Canada – submarines are complex and other countries have had expensive problems with theirs as well. Byers discusses the options available if Canada wishes to replace the current submarines. He argues that the navy must start communicating the submarine replacement requirement now and preparing itself for a vigorous public debate. His conclusion is that Canada must either buy new submarines or shut down the submarine program.

Dave Perry, from the Canadian Global Affairs Institute (CGAI), discusses the Defence Policy Review and what he thinks is coming next for the RCN. He argues that there are indications that the Canadian economy will face continued weak growth. In addition, the Trudeau government made a series of expensive promises during the election campaign in 2015. Perry suggests that these factors will limit the chance of defence spending increases at a time when the DND capital plan is already underfunded. He was encouraged, however, by the fact that the

current government has taken ownership of the NSS and is taking steps to keep it on track and on schedule. Moreover, the *Halifax* modernization is now complete and the number of operational frigates has increased dramatically. In addition, he points out that the submarine force is now making a sustained contribution to operations at home and overseas, providing a counterpoint to some of Michael Byers' arguments. Less encouragingly, Perry argues that the defence review is unfolding without any clear evidence that it is 'fiscally grounded.' He expects the navy increasingly to be the government's tool of choice primarily because the RCN is the only service with the capacity, within existing resources, to take on additional activity. If the RCN and its long-term plans are to succeed, however, it will need to provide a compelling narrative to convince Canadians of the need for increased defence spending.

A theme calling for better communications is stated or implied in every one of these articles. This started with the need for better communications among the navy, government departments and industry. This is what got the NSS underway, and clear communication must be rigorously maintained if the program is to succeed. Perhaps even greater attention will be required in the government's external communications. This would involve everything from explaining the NSS's successes, maintaining tight discipline against requirements-creep in the CSCs, outlining the requirements for the 'NSS after next,' to explaining what the navy does for Canadian security.

Yet there are increasing problems in communicating defence procurement information to the Canadian public. The firms responding to the Request for Proposal (and their subcontractors and their employees) for the CSC have been told not to comment publicly on most aspects of the bidding process. As the prohibition includes advertising, at least one of the leading Canadian defence industry journals faces the risk of closing as a result. A similar restriction, termed a lifetime non-disclosure agreement, was recently placed on 235 Air Force and civil service members prohibiting them from commenting on the CF-18 replacement program. In this climate, I believe independent journals like *Canadian Naval Review* are providing an important venue for open debate on these questions. This *CNR* issue in particular is offering unique and relevant comment on important procurement issues, and I thank the Naval Association of Canada for its support in getting the issue out. 🍷

Dr. Eric Lerhe

#### Note

1. *CNR* contacted the five presenters and they agreed to provide articles for this issue. The authors were all paid an honorarium for their articles.



# Some Observations on Canada's Experience Building Warships

Michael Hennessy\*



Credit: Canadian Navy Heritage website, image negative number CT-284/National Defence

The Canadian *River*-class destroyer HMCS *Restigouche*, circa 1944-1945. *Restigouche* was commissioned as the British C-class destroyer HMS *Comet* in 1932. She was transferred to the Royal Canadian Navy on 15 June 1938 and renamed *Restigouche*.

Major warship construction commenced in Canada during the Second World War. Since then Canada has on several occasions undertaken to build modern fleet units in Canadian shipyards. Eschewing the practices of many countries, the Canadian model mostly rejects state ownership of naval building yards and prefers something akin to an industrial private-public program of supporting commercial shipbuilders. The navy, Canadian state contract agents and commercial shipyards thus form three legs of the Canadian model. Classes of ships built under such a model have included the 70 vessel *River*-class frigate program of the Second World War, the *St. Laurent* DDE program that commenced in 1949, and its follow-on *Restigouche* and *Improved Restigouche*, *Mackenzie* and *Annapolis* classes (20 ships all with the same basic hull design), the DDH 280 class (four ships completed in the early 1980s), and the Canadian Patrol Frigates (12 ships, the first of which was completed in 1991 and the last in 1996). Several other minor classes of ships like fleet supply ships and minesweepers have also been undertaken in Canadian yards. This article offers several observations on these efforts with an eye to suggesting some enduring issues that will continue to challenge future Canadian construction efforts.

Today we speak of formal 'project management' as a discipline but this is of relatively recent vintage. The discipline associated with modern project management continues to evolve but most of the 'projects' addressed here commenced before its formalization. Learning by doing proved the hallmark of the earlier programs. The experiences of the Second World War are germane to this discussion. Canada entered the war with a very small

navy lacking in both sailors and ships. It is not necessary to reprise the rapid growth of the navy in ships and manpower to about the size of the pre-war Royal Navy, but there are several notable features of enduring impact. The navy not only grew but fought a war in far distant waters against sub-surface, surface and air combatants. Such actions and growth remained heavily dependent on technical support from both the Royal Navy and increasingly the US Navy. Canada undertook the building of ships domestically and on its own account because neither ally proved capable or willing fully to support the growth of the RCN.

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**Although Canada built nearly 1,000 major ships during the Second World War, it did so with a very undeveloped shipbuilding industry.**

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Although Canada built nearly 1,000 major ships during the Second World War, it did so with a very undeveloped shipbuilding industry. Most yards were small and understaffed for all roles. Shipyards tended to survive on repair work on major merchant ships and the occasional building of small craft such as ferries or fishing boats. During the war, merchant building and naval building and repair work were coordinated by several government departments which attempted to coordinate demand and place new construction in yards capable, or that could be made readily capable, for such work. The most complex warships undertaken in Canada during the war were four *Tribal*-class destroyers laid down in Halifax. With construction near Canada's most important naval yard,

it was thought both naval and civilian construction and management practices could be melded to make this building program a success. The full design and advanced engineering drawings and many large or technical equipment requirements were provided directly by the Royal Navy (RN). Moreover, the RN provided over 400 personnel to the British Admiralty Technical Mission to Canada who provided their skills and expertise to enable Canadian manufacturing. Even with such support the *Tribals* were not completed during the war.

The *River*-class frigate program proved more successful and was also more indicative of the federal government's preferred means of interacting with the industry. Whereas many states maintain state-owned shipyards to build dedicated naval craft (something which continues to this day), the Canadian government preferred to act as both client and patron of the private industries – that pattern of behaviour remains a feature of how Canada does naval shipbuilding and will be explored further when contract forms are explored below.<sup>1</sup>

The *Rivers* originated in a design termed the 'twin screw corvette.' Unlike the corvettes which came to typify the RCN from 1939 to 1943, these ships were more aligned with naval design requirements for speed and sea-keeping, and more in line with the technical specifications of a ship of war. The original corvettes had been based on the design and standards of a commercial whale-catcher but had been adopted by the Admiralty as an easy-to-build emergency program. Canada geared to be a major provider of the twin screw corvettes and it was a credit to the Canadian naval staff that the RCN recommended to the RN that the class be christened 'frigates.' The RN accepted that proposal after

the first keels had already been laid down.

Although Canada won the name challenge – that is, to call the ships frigates – Canadian shipyards remained backward. Again the RN provided the naval architecture drawings and a number of key components, such as the radar and sonar that would be fitted to the ship. However, as these ships were to be built in many yards spread throughout the Great Lakes and West Coast, the government stepped in to coordinate the purchase, warehousing and distribution of long lead items and specialized components. These measures were not part of the original plan but commercial suppliers and international partners preferred not to deal with individual shipyards. Similar tensions had to be overcome with the *St. Laurent*, 280 and *City*-class programs.

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**Despite the experience of the *River*-class program, there had been no effort to maintain the senior and experienced naval technical staff, civilian engineering and architectural staff or experienced builders.**

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Lessons from the arduous wartime development of the management regime for such a complex undertaking as a geographically dispersed national shipbuilding program were almost immediately forgotten at the war's termination. The federal government, however, did turn its attention to trying to define a reasonable and affordable means of preserving some of the shipbuilding capacity developed during the Second World War. The Canadian Maritime Commission (CMC) emerged after several years of consideration as a partial answer. Among the first questions put to the CMC in 1947 was how much shipbuilding capacity Canada needed as a strategic capacity to meet its naval needs. The industry had suffered steep decline and wicked international competition in highly controlled markets. The CMC recommended that total strength in the shipyards should not fall below 7,000 men – a bottom the industry had yet to reach. A review of the CMC's internal records provides little information on how it derived the figure which, though soon superseded by events, retained a certain magical quality in all later internal discussion of national shipbuilding policy.

Geopolitics rather than domestic politics proved the most immediate intervening consideration. The looming Cold War led the government to authorize several new naval building programs, the most notable being the *St. Laurent* program. However, Canada had not retained the capacity to manage the construction of new naval vessels. The tribulations of the first major class undertaken following the Second World War, the *St. Laurent*-class, again illustrates



Credit: Wikimedia Commons

Canadian destroyer HMCS *Ottawa* (H60). She was originally the Royal Navy C-class destroyer HMS *Crusader* (H60) from 1932-1938.





The Royal Canadian Navy *St. Laurent*-class destroyer HMCS *Fraser* (DDH 233) underway during exercise *Distant Drum*, 19 May 1983.

the types of challenges to be anticipated today. Despite the experience of the *River*-class program, there had been no effort to maintain the senior and experienced naval technical staff, civilian engineering and architectural staff or experienced builders. Rather, shipyards languished and the government agency once responsible for purchasing and coordinating supply atrophied. The CMC was thrust into a role for which it had not been designed. In the initial stages of this program it became the main vehicle for the government to verify the technical requirements for this class of ship, to help identify and negotiate with international suppliers for components, such as turbines and gearing, and the chief interlocutor with industry for refining the language and terms incorporated into contracts.

The purchasing agent for the government, the Canadian Commercial Corporation (CCC), requested that the CMC undertake these roles because while the CCC could sign the contracts, it lacked the internal technical expertise to handle such questions. It fell to the CMC to try to pull all the pieces together. Which shipyards were capable? Who could translate naval desires into concrete contracts? Who would select key components? The CMC coordinated technical refinements of the requirements, inspected potential providers, treated with shipyards and their main industrial lobby group (the Canadian Shipbuilding and Ship Repair Association, formed in 1944), and agreed to various contractual terms negotiated by the industry.

Eventually and through the *St. Laurent/Restigouche* programs the role of the CMC gave way to the agents of the Department of Defence Production (formed 1950) which was itself split into the department of Supply and Services and the Department of Industry by the late 1950s. Developing and retaining the governmental staff able to judge technical merit and deal forcefully with the continual naval staff desire to improve what the navy would get, and hold industry partners to account for their performance, has been an enduring issue.

The *St. Laurent*-class build program went through many

similar challenges to the *River*-class program. It is not necessary to summarize the entire building effort but a few points will be offered in light of what we would consider good project management. For good project management today we would expect work only to commence with the detailed engineering and related design work complete. This would include the details of all components being built into the ship, from fire control systems to sensors, pumps, fittings etc., including their wiring diagrams, supply schedules, fabrication requirements, etc. Costs increase exponentially when designs are not settled or large components are not fitted at optimal times during construction. One rule of thumb is that fitting simple things like pumps is seven times more costly once a ship is in the water than when it is first being fabricated in the yard.

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### **Costs increase exponentially when designs are not settled or large components are not fitted at optimal times during construction.**

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But modern project management standards had yet to be written when the *St. Laurents* were undertaken. Their construction proved more artisanal. The Royal Navy provided one of its most imaginative and experienced naval constructors to be the vessel designer. The commercial firm of German and Milne which had played a key role in designing and coordinating activities for the *River*-class ships was engaged to provide the detailed drawings. Eventually a larger Naval Central Drawing Office manned by naval officers and civilians was formed in Montreal as a special private-public partnership housed at Vicker's Marine in Montreal. The aim was to build the lead ship in Montreal. Steel was cut before the detailed engineering and architectural design of the superstructure had been completed (and in some areas had not commenced). The first two follow-on ships were laid down with a number of design issues still in flux so ultimately the navy ended up with three prototypes each slightly different in many ways as local fabrication to a rough design was undertaken to speed or continue work. A large part of the delay in finalizing the design resulted from arguments among



the naval staff about the best configuration for the bridge and operations room. The navy also changed a number of requirements as the program continued when it found newer or more desirable sub-components. The contract agent, the CCC, grew increasingly aware of these cost inflators but was hard-pressed to prevent them as the navy dug in its heels over a number of technical issues. The shipbuilders were both bemused and enriched by these delays given that the contracts covered their overheads. As the *St. Laurent* program gave way to the *Restigouche* program, the CCC/DDP sought to discipline both the industry and navy through changing contractual terms to ensure better control and measure costs.

It is important to digress on this latter point. Contracts solidify relationships between buyer and provider who have both mutual interests and mutual conflicts of interest. In the case of building warships, the state has several divergent interests. The first is as purchaser desiring a fair financial deal. The second is as champion or patron of the industry developing technology and capabilities at the very edge of knowledge. In that sense the patron recognizes the venture has an indistinct boundary between the surety of purchasing something already in production and uncertainty of developing not only the product but the capacities to build – that is, design, fabricate, test and field a new complex industrial output – which develops the supplier's capacity to supply what is promised in a timely and cost-effective manner. These tensions are accommodated in part by the various contract forms favoured by purchaser and the suppliers.

Contract theory is complex and evolving (as seen in the recent awarding of the Nobel prize in economics to experts in contract theory) but even so the state has long recognized that it would prefer to purchase warships under contracts that are largely fixed price. However, given the uncertainties of design immaturity and the requirement to support the creation of fabrication facilities and expertise, industry has repeatedly avoided such a



*The Canadian DDH 280-class destroyer HMCS Algonquin (DDG 283) underway in formation with the Nimitz-class aircraft carrier USS John C. Stennis prior to Rim of the Pacific Exercise 2004, 25 June 2004.*

requirement by refusing to accept such risk and quote firm costs. This problem existed during the Second World War when cost plus 5-7% became the norm and has marked every program since.

Efforts to change the contract form and shift the risk from the purchaser (the government) to the provider have been undertaken since and made great strides in the continuing building programs of the 1950s and early 1960s. Efforts to control costs and shift to incentive bonus, fixed fee and man-hour target formulas were all tried during this period and met with marked success as the follow-on classes to the *St. Laurent* were built. The fact that the follow-on ships used many of the same basic components and hull dimensions helped control costs.<sup>2</sup> Indeed the maturity of the entire supply and testing chain developed through the program allowed the final vessels, even with highly modified superstructures, to be produced with greater appreciation and control of cost components.

Many of those advantages were lost in the next major building program that resulted in the DDH 280 class. With the Canadian Forces in flux due to 'unification,' the navy's technical staff were in chaos during the initial stages of the program. Delays in purchasing new warships meant that the industry shed its specialized naval building teams. Long delays in placing orders also meant that the industry divested itself of much technical expertise that had to be recreated during the program. The 280 program repeated many of the mistakes associated with the initial



*The Canadian Halifax-class frigate HMCS Ottawa (FFH 341) departs Naval Station Pearl Harbor, Hawaii, 8 July 2008, to participate in Rim of the Pacific (RIMPAC) 2008. HMCS Ottawa is the twelfth and final ship of the Halifax-class that was built as part of the Canadian Patrol Frigate Project.*

*St. Laurent* program from cutting steel before the design was mature to relying on the navy to refine its needs as the program progressed and many similar issues.<sup>3</sup> Costs proved excessive and the program risked cancellation. Extraordinary steps were taken by the state's project managers to rein in the shipbuilders and control costs.

Anxious to avoid repeating the mistakes of the 280 program, the Treasury Board insisted on more stringent cost control measures being incorporated in the next major building project – the Canadian Patrol Frigate (CPF) program. Approved in principle in 1972 and commenced in 1976, the CPF program was the first to allocate responsibility for all aspects of design and construction to a single shipyard. The contract eventually went to Saint John Shipbuilding after a long competitive process of pre-selection and a competitive design process employing the principle of 'negative guidance' wherein the navy could veto certain design elements but could not suggest a preferred model or provider. This control measure lengthened the pre-construction competitive design phase. Even so this attenuated competitive design phase greatly matured the design and helped the successful bidder refine its engineering and cost estimates.

Still, given the risks associated with building any new design and requirements that the federal government provide a number of key components (such as key weapons systems components provided by allies on a government-to-government basis), the formal contract was not fixed price. As the program developed, delays resulted from sub-component manufacturers proving slow to refine their engineering. This greatly retarded the government's ability to provide a number of the sensitive components or to provide sufficient detail of their fabricating requirements to allow work elsewhere in the vessels.

Several such issues resulted in a series of large lawsuits between the prime contractor and the government or sub-contractors. Cumulatively the largest of these lawsuits resulted in the renegotiation of the prime contract to compensate for the additional costs associated with such delays. Ironically once the Crown compensated for the additional costs, the renegotiated contract resulted in the final contract for Saint John Shipbuilding moving to a fixed price formula. A separate financial arrangement was also made for the prime sub-contractor that caused delay. All in all, the project came in largely on budget at \$10.5 billion for 12 ships, but the project which had received its official start in 1976 was not closed out until 2005 (nearly a decade after the last ship was actually delivered). An objective of the program had been to establish a "continuing and autonomous capability in warship design, integration,



HMCS *Halifax* in the dry-dock at Halifax Shipyard for the beginning of the Frigate Life Extension (FELEX) Mid-Life Refit process, 1 October 2010.

testing and program management in a Canadian company."<sup>4</sup> That was achieved at Saint John Shipbuilding but the government did not place any timely additional orders and the capabilities built up were soon shuttered.

The current national shipbuilding program aims to break this boom-and-bust cycle. In light of the preceding discussion we can see some important breaks with the past. Project management methods are more widely understood, contracts details trading off risk and reward are also more widely understood, and modern design capabilities such as computer-assisted design were non-existent during the *St. Laurent* program, fairly rudimentary at the inception of the CPF, and are now commonplace. The navy's ability to introduce design changes after contractual undertakings are made is also more constrained. All these developments augur well that future building will not repeat a number of basic problems associated with previous efforts. But building modern warships and supporting the creation of a national technological enterprise to do so will remain a risk-rich adventure and commercial enterprises must find the means to be compensated for those risks or go bankrupt despite the best laid plans. 🍷

#### Notes

- \* The opinions expressed in this article are those of the author, not the Department of National Defence.
1. Two shipyards were nationalized for the duration of the war.
2. On modern contract design, the works of Oliver Hart and Bengt Holmstrom are good starting points. See The Royal Swedish Academy of Sciences, "Press Release; The Prize in Economic Sciences," 10 October 2016. On Canadian experience see Jeremy Stuart, "Captains of Industry Crewing the Ship of State: Dollar a Year Men and Industrial Mobilization in WWII Canada, 1939-1942," MA Thesis, University of Calgary 2013, pp. 42-48; and on the permutations experimented with through the *St. Laurent* and sister vessels, see Michael A. Hennessy, "The State as Innovator: Controlling the Command Technology for Warship Construction in Canada, 1949-1965," in Peter Baskerville (ed.), *Canadian Papers in Business History*, Vol. 2 (Victoria, BC: The Public History Group, 1993), pp. 147-177.
3. J.W. Arseneault, "The DDH 280 Program: A Case Study of Governmental Expenditure Decision Making," in David Haglund (ed.), *Canada's Defence Industrial Base* (Toronto: Ronald P. Frye, 1988), pp. 118-36.
4. Canadian Patrol Frigate Project. "Project Completion Report," 27 July 2005. I thank Commodore (ret'd) Eric Lerhe for providing me this report.

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# Assessing the Progress of Canada's National Shipbuilding Strategy

Tom Ring

**Editor's Note:** Please note that the author was not involved in the selection of the photos, or the photo captions, which are included to illustrate this article.

Six years ago, the government of Canada, through the National Shipbuilding Strategy (NSS), embarked on a massive undertaking. No defence procurement has had the ambition of the NSS's strategic goals, namely to recapitalize the Royal Canadian Navy (RCN) and Canadian Coast Guard (CCG) and to do so in a manner that produces a sustainable Canadian shipbuilding industry.

This is the second in a series of articles written about the NSS.<sup>1</sup> With the first, I examined the logic behind the NSS, reviewed the principles behind the successful selection process, assessed what the shipyards and Canada received in setting out the strategic partnership (including the potential economic benefits for Canada), looked at the progress being made in the achievement of the overall goals that had been set for the NSS program, and touched on a few of the key challenges to be addressed going forward.

In this article, I explore the challenges facing the NSS program, and offer some suggestions on actions that should be taken if the overall goals of the NSS are going to be achieved. This article begins by providing the relevant background of the NSS program prior to exploring the challenges, and offering conclusions and recommendations for action.

## Background

We should start with an assessment of first principles. Why does the NSS exist? An understanding of the conditions and assumptions that led to the creation of the NSS is an essential part of understanding why it was shaped as it was. It is also a critical element to consider in determining whether the program is meeting its intended goals. So let's review the factors that led to the adoption of the NSS.

Several factors contributed to the development of the concept that we now call the NSS. Almost 15 years ago, officials in the Department of National Defence (DND) and the coast guard had identified near-term capital investment projects of over \$30 billion, involving over 30 vessels. (It should be noted here that many factors affect cost estimates for complex projects that take many years, and in some cases decades, to complete. The initial program costs that were made public in 2010 were not



*The Honourable Judy M. Foote, Minister of Public Services and Procurement, announces a simpler and faster approach to delivering the new fleet of surface combatants to the Royal Canadian Navy through a more streamlined procurement strategy, 13 June 2016.*

intended to be then, nor should they be now, definitive project-by-project cost estimates. Rather they are an indicative measure of the massive size of the shipbuilding program that would be needed.) Essentially, due to a lack

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of any large vessel construction since the 1990s, the RCN and the CCG fleets required a complete rebuild.

Historically, the building of federal ships in Canada has been carried out on a project-by-project basis. Shipyards often drifted in and out of bankruptcy protection, were restructured or bought by new owners or managed to get by on infrequent vessel construction projects or repair and overhaul work. Without a long-term plan, vessel procurements provided for short-term employment, often at a high cost to taxpayers. This 'boom-and-bust' cycle of shipbuilding meant that the skilled labour required to build vessels had to seek work in other fields during extended periods of inactivity. Further, without any guarantee of future work, shipyard owners were not inclined to invest in technology improvements to keep pace with advancements in the craft of building complex vessels.



*Born out of a failed procurement effort, the Joint Support Ship is still behind schedule with no contract signed to date. Artist rendering of the definition design for the Joint Support Ship.*

In 2006, the government reconfirmed a 2001 policy decision, and what was essentially a longstanding trend in Canada, that federal vessels would be built in Canada. This was, in part, to ensure that the expenditure of tens of billions of dollars of taxpayers' money returned as much economic value to Canada as possible. Moreover, it reflected the practice in most countries around the world when it comes to large defence acquisitions.

Some people argue that it would be cheaper and faster to build offshore. This assertion may or may not be correct, but unfortunately it cannot be either proven or disproven. The challenge of the build-in-Canada approach is to do so in a manner that respects value for money while ensuring that the billions of dollars of economic benefits remain in Canada. Unfortunately, it is simply not possible to seek quotes from offshore builders for vessels that have yet to be designed, or at least not without incurring high risk premiums and questionable price quotations. Thus while in theory and/or practice, there may be lower labour costs in foreign shipyards, how this would affect the final price for vessels cannot be stated with certainty, given that labour costs typically represent approximately 30-35% of the cost of building complex vessels.

Following the 2006 announcement, the first attempt to rebuild navy and coast guard vessels revealed a number of issues affecting the plans to rebuild the federal fleets over the course of 25-30 years. The failed attempt to procure the Joint Support Ships (JSS) for the navy brought these issues into clear focus. The unaffordable bids carried an additional 25% risk premium and when the process was stopped almost \$50 million had been spent, and there was nothing to show for it. Having not built any vessels for the government in 15-20 years, the Canadian shipbuilding industry was not well-positioned to deliver on Canada's ambitious shipbuilding objectives. An extensive review of the industry in 2008 concluded that significant investment in capacity building for the shipbuilding industry was going to be required. It was clear that a new approach to vessel procurement in Canada was needed.

In consultation with Canada's shipbuilding industry,

government officials developed the strategic partnership approach known as the National Shipbuilding Procurement Strategy, now the National Shipbuilding Strategy (NSS). During this consultation process, most participants supported establishing a strategic relationship with only two shipyards to build all large ships. One shipyard would build all combat vessels; the other, all non-combat vessels. Dividing the work into two packages also addressed the real concern that there be sufficient bids to make the

process truly competitive. While there were five shipyards in Canada that were generally considered capable of doing the work – Seaspan in Vancouver, Seaway Marine in St. Catharines, Davie in Quebec City, Irving Shipbuilding in Halifax, and Peter Kewit in Marystown, Newfoundland – two had traditionally concentrated their efforts on ship repair and construction of smaller less complex vessels than were required for the RCN and CCG. Additionally a third, Davie, was in financial difficulty. It was believed that in a competition for the packages of work involved, Davie would resolve its financial difficulties and submit bids and the two remaining yards would aggressively pursue both packages thus resulting in a competition within a competitive process. This analysis turned out to be correct.

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This new approach was finally approved by government in late spring 2010. In approving the strategy, it was accepted that with five possible bidders spread across all regions of Canada, there would be three losers among Canada's shipyards. Officials were instructed to ensure that the process for selecting the winning shipyards was fair, open, transparent and, perhaps most ambitiously, free from any political involvement in the decision-making process. This notion of the selection process being free from political involvement was actually a crucial component of the eventual success of the selection process and will be further explored below as a factor in the success of the program going forward.

Having reviewed the logic supporting the government's approach to the recapitalization of Canada's fleets, I will now turn to some of the challenges being experienced in the early stages of the build process.



## *The Challenge of Implementation*

The task of implementing six to eight multi-billion dollar projects simultaneously over a period of 10-25 years is a monumental program management challenge. Complex procurements come in various degrees of difficulty. Acquiring complex systems of any kind is always fraught with challenges, even if they already exist and only require some modification or change to ensure they can be integrated with other existing systems. Acquiring complex systems that do not exist and have to be designed is another order of difficulty. Acquiring platforms with multiple systems that are designed from scratch and that must integrate new or existing systems from a variety of equipment providers from around the world is really at the other end of the scale of difficulty. The NSS program challenge is to acquire six to eight of these platforms, with several of these projects being managed at different stages of development simultaneously.

There needs to be a clear understanding of the many challenges that will be faced. The inadequate project budget has already been publicly acknowledged. The pressures that this alone will place on ongoing program management will be significant. Deadlines will be missed. Not because of any failures of management, but because the problems that will be encountered will invariably take longer to resolve than anyone can anticipate. There will be

unforeseen technical challenges associated with translating design concepts into building strategies. And there will inevitably be unforeseen construction difficulties. For anyone who has been involved in managing complex procurement projects, these challenges are generally known and understood. They are unfortunately less well understood by politicians and the general public at large. And even when understood by the media, or industry insiders or critics, these challenges will be overplayed or misconstrued to serve their own purposes.

Managing the challenges outlined above will require an unrelenting commitment to three areas that will determine whether or not the NSS program is successful. These are: the overall program management approach (rather than managing the NSS as a number of individual projects); ensuring appropriate contract management vehicles; and political leadership. While there is certainly a connectivity among all three, I will examine each individually.

The overarching crucial factor in successfully managing the NSS implementation is the decision-making or governance of the entire program. There are many different departments and agencies that are involved in one way or another in the NSS program. There are of course two client departments, National Defence and the Canadian Coast Guard. Within each of these client departments, there are both



Credit: Seaspan

Sparks fly during welding on the **Ruby Princess** cruise ship when it was in dock at Victoria Shipyards in December 2015.



the user and the organization that is charged with acquiring equipment for the user. Next there is Public Services and Procurement Canada (PSPC). The Department of Industry, Science and Economic Development (ISED) has responsibility for ensuring appropriate economic benefits are delivered as part of the procurement process. The Department of Finance concerns itself with budgeting and funding issues, the Treasury Board Secretariat has governmental management responsibilities, and the Privy Council Office ensures that the procurements meet the government's overarching strategic agenda.

The unique governance/decision-making processes adopted for the selection process were a critical part of shaping a successful result. One of the greatest attributes, and at the same time one of the worst attributes, of the public service of Canada is its tendency to make decisions in silos, as if these silos are in competition with one another. Each of the organizations, departments and agencies mentioned above often compete with each other for resources, access to Ministers and pursuing their own unique interests. The governance/decision-making processes that were implemented for the NSS selection process minimized or eliminated siloed decision-making. In approving the NSS program the government of the day made clear that officials who were charged with the responsibility of overseeing

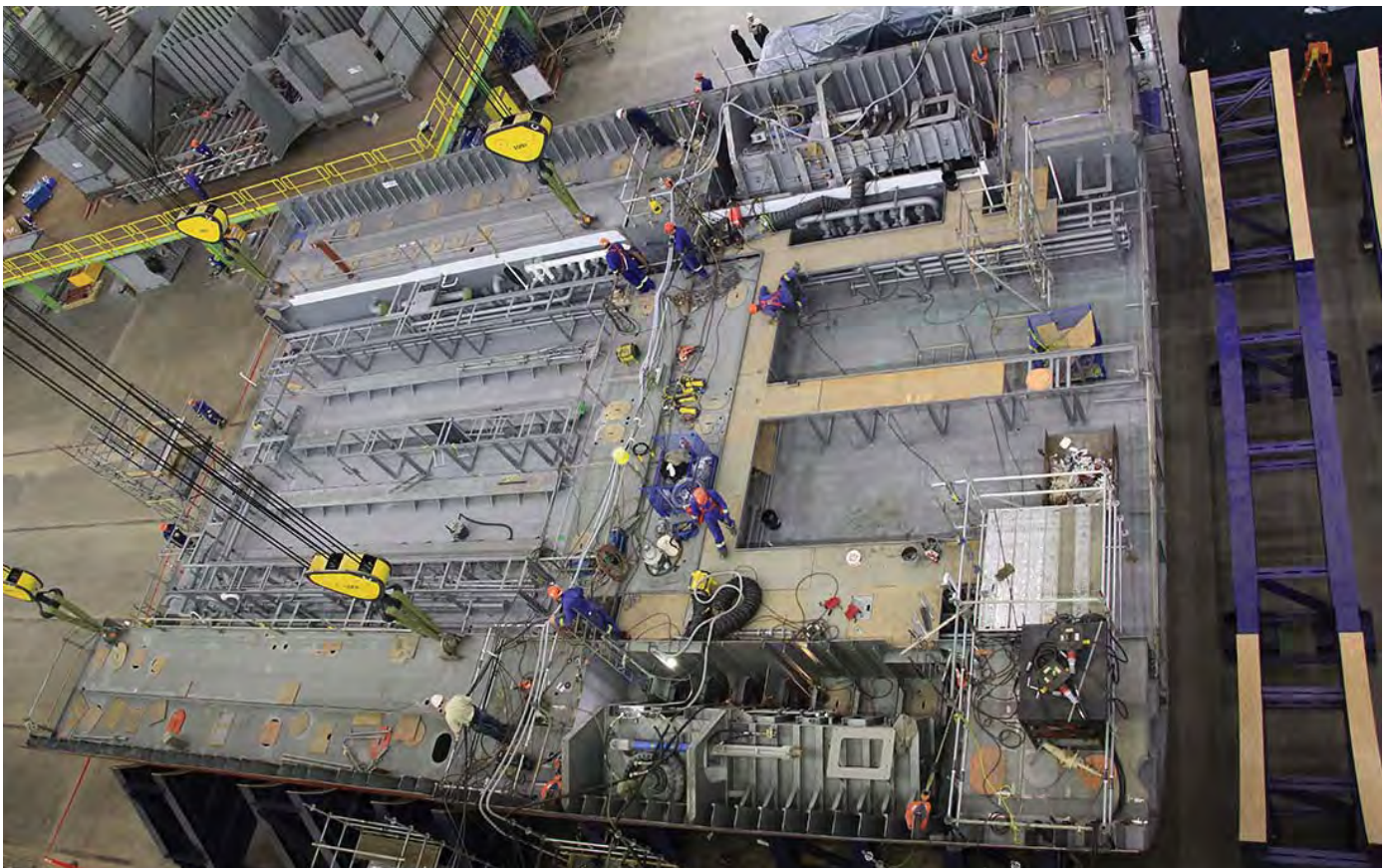
the process were collectively and not individually accountable for the results, a unique way of managing a large project that crossed multiple ministerial accountabilities.

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A committee of Directors General from all of the involved departments and agencies met frequently to decide upon operational issues. A similar group of Assistant Deputy Ministers made the strategic decisions and, finally, Deputy Ministers held the ultimate accountability for ensuring success. Common secretariat support ensured that every level of decision-making was provided with the same information to support their consideration of any issue. These decision-making structures, which were implemented as the NSS selection process commenced, were tentative at the outset. For anyone who has been involved in committee decision-making this is a normal expectation. Over time, as difficult decisions were taken, and relationships within these committee structures solidified, there developed a genuine belief that collective accountability and shared decision-making was the most



Credit: Halifax Shipyard

Units 145 and 146, the first two units of HMCS *Harry DeWolf*, are officially joined together at Halifax Shipyard, 19 May 2016.



effective approach. The absence of any political involvement in the selection process was also a unique factor.

These decision-making structures remain largely in place. However, three things have changed. First, while it is to be expected that over time people will change positions, there has been, within a relatively short period of time, an almost complete turnover of all of the relevant individuals who were involved in the decision-making processes between 2010 and 2015. In fact over 20 of the 28 individuals, originally charged with the decision-making in the selection process, changed between the fall of 2014 and mid-2015. Second, and probably as a result of the previous factor, the commitment to shared decision-making and collective accountability has been weakened. Evidence of this can be found in the simple fact that in the fall of 2016, the renegotiation of an existing construction contract was ordered without such a request coming from the government's contract manager (PSPC), or the endorsement of the Deputy Ministers' Governance Committee itself. Third, the establishment of a Cabinet Committee on Defence Procurement means that the absence of political involvement in decision-making, so critical to the success of the selection process, is not a concept embraced by the current government.

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### **The mixing of politics and procurement, especially military procurement, rarely if ever leads to a successful result.**

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The second area I would like to touch on is that of contract management. While there are a variety of contract tools available to the government to manage the many different components within the NSS program, almost all of them fall into the category of what is referred to as a 'discrete' contract model. Briefly described, a discrete contract involves a one-to-one relationship where there is an exchange between the contractor and the contractee for the provision of goods or services in exchange for a fee. Despite appearances that such a model could be applied to the NSS, the use of multiple discrete contracts to implement the program is likely to have disastrous effects. There is, should be and must be overlap and connectivity among all of the contracts for each project (ancillary, definition and construction), as well as the various projects in each shipyard. A discrete contract model is simply not flexible enough to deal with the kinds of challenges, both foreseen and unforeseen, that will arise.

The NSS program requires a 'relational' contract model. In relational contracting the explicit terms of the contract provide a general outline of what the two parties expect to accomplish in a trust-based relationship. The parties to

the contract understand and accept that expectations of what will be delivered, in what time-frame, and at what price will have to be adjusted over time as circumstances change. Such a contract model challenges the often rigid terms and conditions that are present in normal government contracts. Relational contracting is not new, but it is not a model that is familiar to government officials. Adoption of such an approach by the government will require a significant adjustment in how it normally approaches contract management. Such an adjustment is urgently required.



*Ottawa needs decisive political leadership to fast-track some stalled shipbuilding programs. Shown here is Davie's proposed conversion of MV Aiviq to a polar icebreaker for the Canadian Coast Guard.*

The third area that will have a significant impact on successful NSS program implementation is political leadership. The mixing of politics and procurement, especially military procurement, rarely if ever leads to a successful result. Examples that support this assertion are numerous. The 1986 decision regarding maintenance of the CF-18 fleet and the 1994 cancellation of the maritime helicopter project are among the more visible, but there are others if further evidence is needed. One example of the opposite that can be pointed to was the decision in 2010 to eliminate involvement by any politician in the NSS selection process, and to empower a group of public servants to make the difficult decisions required. Of course it remains to be seen which approach the current government will adopt when the difficult and perhaps politically unpalatable decisions on the NSS program are required.

### **Conclusion**

The decision to recapitalize Canada's fleets, and to do so in Canada, was both bold and strategic. It was an approach that was uniquely supported by all political parties, as was the result of the NSS selection process announced in October 2011. Bold decisions usually require the adoption



*Can the on-time, on-budget success of the **Halifax**-class modernization project be carried over into the National Shipbuilding Strategy? Vice-Admiral Ron Lloyd, Commander Royal Canadian Navy, remarks on the completion of the refit of HMCS **Toronto** during a ceremony at Irving Shipbuilding in Halifax, 29 November 2016.*

of new approaches to management and the acceptance that these new approaches will require a higher risk tolerance than the status quo. This was certainly proven to be the case with the NSS shipyard selection process. While we are early in the implementation process, there is little evidence of a continuation of new management approaches and a higher risk tolerance.

In its most recent status report on the NSS released in spring 2016, the government acknowledged many of the challenges that have been set out in this article. This included ineffective decision-making, lack of program management expertise, inadequate budgets and insufficient communications with Canadians to name just a few. Initial projects were stated to be behind schedule.<sup>2</sup> Very little has been said by the government about the NSS since the spring report. No one should be surprised therefore when the next NSS challenge comes to the fore and the cries for dumping the entire program begin anew. This is not the fault of the media, which of course will be only too happy to report on the inevitable conflict between those who support NSS and those who do not.

What should be done? I recommend three things. First, Ministers should have a difficult and serious discussion on the role of their political leadership on this important file and the challenges implicit in shared accountability for a complex program that involves many government departments and agencies. Ongoing tactical involvement, through a Cabinet Committee on Defence Procurement,

institutionalizes the mixing of politics and procurement and is likely to result in more political problems rather than less. The government should appoint a single Minister as the lead for all matters on NSS (as was done in the selection process). This Minister's Deputy Minister should be identified as the Program Executive Officer (a model used elsewhere). Further it should be made clear (by including provisions in the accountability contracts of all Deputy Ministers involved) that failure to deliver on program commitments will be reflected in all of their performance assessments. The NSS is too important to the RCN and the CCG, and to the thousands of workers engaged to build these ships, to be sacrificed due to confused ministerial and bureaucratic accountabilities.

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Second the government should engage a world-renowned consulting organization with deep complex program management experience to assess the structures and decision-making processes that are needed to be successful. Earlier efforts to do exactly that – in 2012 Price Waterhouse Coopers was asked to do such a review – were rejected because the costs associated with overall program management would have to be borne by individual projects the budgets of which were already known to be inadequate.

And third, the government should formally adopt a relational contracting model in partnership with the shipyards and the government departments that are most involved in the program.

No one ever said that recapitalizing Canada's fleets would be easy. If the actions above are urgently undertaken then the prospects for success are good. In short, 'steady on ... but prepare for heavy weather.' 🇨🇦

#### **Notes**

1. Tom Ring, "The National Shipbuilding Procurement Strategy: How did We Get to Where We are Now?" Canadian Global Affairs Institution, March 2016.
2. Public Services and Procurement Canada, "National Shipbuilding Strategy: February 2012 to December 2015 Status Report," 2016.

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# Building Canada's Next Navy: Strategic Basis and Fleet Mix

Elinor Sloan

The past decade or so has not been kind to the Royal Canadian Navy (RCN). The service has struggled to recapitalize several classes of ships, leading to capability gaps and challenging the RCN's ability to undertake independent blue-water operations. Efforts to develop an entirely new capability – navy ships that can cut through Arctic sea ice – has proceeded at a slower pace than originally anticipated. A national shipbuilding strategy launched in 2010, although well-conceived, is still some time off from producing a ship. And the launch of a defence policy review in 2016, while a good thing, has inevitably delayed defence decisions still further as the government awaits the review's outcome. The silver lining in all of this is that it gives Canada the opportunity to reassess the strategic basis for recapitalizing the RCN, and to determine the best fleet mix to achieve its national objectives.

This article examines strategic considerations that Canada will want to take into account as it recapitalizes its

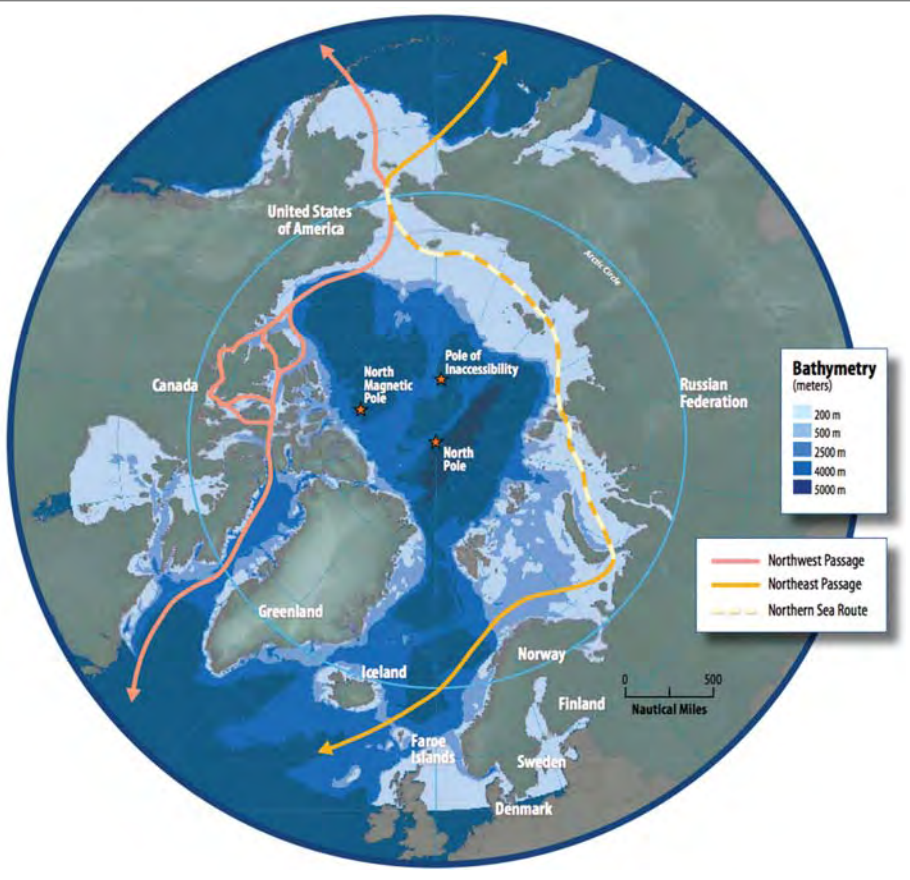
navy. It identifies necessary fleet components and attributes in response to these developments, discusses the RCN's capacity in each area, and highlights persisting gaps in capability even with the recapitalization. The article concludes with some thoughts on what's next for Canada's shipbuilding strategy.<sup>1</sup>

## Strategic Considerations

For Canada, one of the most important long-term strategic developments is the opening Arctic waters and the resulting increased interest in the region both as a shipping/transit route and as a destination in itself to extract resources. Depending on the ports involved, trans-Arctic shipping can cut navigational distances between Europe and Asia by up to 40%. Models project that unescorted (by icebreaker) navigation in the high Arctic will be possible by 2030-40 and probable by 2050. Already sailing time across the northern sea route has declined by half (20 days to 11 days) since the 1990s because of the easier

summer ice conditions.<sup>2</sup> Opinions vary, however, on the degree to which melting Arctic waters will translate into significant levels of shipping any time soon. The isolated environment, lack of infrastructure and accurate charts/maps, and potential for unanticipated weather and ice conditions make it a high-risk transit route. But the overall trend is toward increased traffic, both for commercial shipping and tourism.

The Arctic is also a region of interest for its oil and gas reserves. A 2008 study by the US Geological Survey (the most recent available) determined that the "extensive Arctic continental shelves may constitute the geographically largest unexplored prospective area for petroleum remaining on earth."<sup>3</sup> Most of the offshore spots where there is likely to be a large oil or gas field are within the Exclusive Economic Zone of one of the Arctic states and, since all Arctic states are following the UN Convention on the Law of the Sea to address disputes, the prospect of a resource conflict in the Arctic would seem to be low.



Map of the Arctic region showing the Northeast Passage, the Northern Sea Route and Northwest Passage, and bathymetry.



Russia launched its sixth and final Project 636.3 (Improved *Kilo*-class) diesel-electric submarine *Koltipino* for the Black Sea Fleet on 31 May 2016.

But the relatively peaceful current circumstances of the Arctic have the real potential to change. The status of the Lomonosov Ridge running across the Arctic floor from Ellesmere Island/Greenland to the New Siberian Islands is as yet unresolved. Russia has prioritized the Arctic for its future prosperity and security and to this end is building nuclear-powered ballistic missile submarines, a fleet of diesel-electric and nuclear-propelled icebreakers, and is establishing a network of Arctic naval bases to station submarines and warships in the region permanently. Non-Arctic countries have also demonstrated a growing interest in the Arctic for both its resources and potential shipping routes.<sup>4</sup> China, for example, has been active in the region for many years and in 2016 commissioned its second polar-class icebreaker. Taken together, these maritime trends present at minimum the risk of future interstate conflict in the Arctic for Canada.

A second strategic consideration is the return of great power competition. Both Russia and China are challenging the existing US-led international order, in part by pursuing expansive naval doctrines and modernization programs designed to forestall US naval access to regions of strategic interest. In 2015 Russia released a new maritime doctrine that paid particular attention to increasing its naval potential in the Arctic and Atlantic, and specifically framed Russia's naval buildup in terms of countering NATO's "unacceptable" expansion to Russian borders.<sup>5</sup> Russia is strengthening its Baltic and Black Sea Fleets with new or upgraded diesel-electric or attack submarines, as well as warships. Many of these platforms are armed or being armed with a new supersonic cruise missile.

A key aspect of Russia's naval recapitalization is its emphasis on submarines. It is building some of the quietest diesel-electric submarines in the world, with a primary mission of anti-submarine and anti-surface ship warfare.<sup>6</sup> In the past few years Russia has significantly increased its submarine patrols in the North Atlantic and the Baltic Sea, presenting the potential to block NATO sea access to

the Baltics in the event of hostilities.<sup>7</sup> More recently Russia has increased its patrols in the Mediterranean, action that is seen as designed to curtail Western access to the Black Sea, Suez Canal and eastern Mediterranean.<sup>8</sup>

Meanwhile China's 2015 Defence White Paper states that while the country will continue to focus on its traditional naval strategy of "offshore waters defense" it will now, and increasingly in the future, combine that strategy with a new concern for "open seas protection."<sup>9</sup> Over the past decade and a half China has transformed the military capability of its navy, investing heavily in submarines, surface ships, amphibious ships, maritime patrol aircraft and anti-ship cruise missiles, as well as commissioning an aircraft carrier.<sup>10</sup> Much of China's naval modernization is well-suited to denying US naval access to the region in the event of a crisis.

Increased military capability makes sense for a growing power, but China's new doctrinal emphasis and dramatically increased naval capability must be seen in light of its bullying behaviour toward regional countries and its building of artificial islands in the South China Sea, counter to international law. Tension in the region is rising. If, in the event of crisis, China were to deny the United States access to waters in the Philippine Sea, East China Sea or South China Sea, there would be instability and a heightened prospect of regional conflict.

A third strategic concern for Canada is the lack of governance in the littoral regions of the world. Much broader than simply 'coastal,' the littoral regions span from areas of the open ocean to the shore which must be controlled to support operations ashore, to the area inland from shore that can be supported and defended directly from the sea.<sup>11</sup> By virtue of humanity's settlement patterns, the vast majority of humanitarian disasters and civil wars, and associated things like terrorist activity, piracy and



Chinese Type 052C air defence guided-missile destroyers can carry 48 HHQ-9 long-range surface-to-air missiles to provide area defence to the Chinese carrier fleet.



refugee flows, is likely to take place in the littoral regions of the world.

The littoral region is a particularly difficult operating environment. A relatively confined space, it can include friendly forces, adversaries and neutral parties all at once, making identification exceedingly difficult. Complexity is compounded by a joint environment made up of land, sea and air forces. In the seaward portion of the littoral regions one of the biggest concerns is quiet diesel-electric submarines, a platform that has always been difficult to detect but is even more so today with technological advances and the dramatic proliferation of such platforms, especially in the Asia-Pacific region.

### **Force Mix**

For Canada the challenge is to determine the necessary naval force/fleet mix to meet these strategic concerns, and to integrate any new elements into a shipbuilding program that is already underway.

In the Arctic the requirement is to be able to conduct surveillance and control of the region – that is, to know what is happening in and under Canada's Arctic waters and be able respond to circumstances that threaten Canadian interests, or to a civilian emergency situation. Current Canadian naval capabilities in this regard are limited. Canada's *Victoria*-class submarines can conduct the surveillance of Arctic waters but only during the summer months and only up to the ice edge. Once launched Canada's Arctic Offshore Patrol Ships (AOPS) will be able to conduct sustained operations throughout the Arctic during the navigable season, which from a presence and control perspective is the season that matters the most.

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But outside that season the AOPS will have to operate in conjunction with a coast guard icebreaker and the Canadian Coast Guard itself faces severe fleet challenges. A planned new polar-class icebreaker is still many years from being built.

The AOPS will be a unique and valuable asset and will be in high demand. The ships are to provide situational awareness throughout Canada's Exclusive Economic Zone including not just the Arctic but also the East and West Coasts. Missions like fisheries protection and escorting ships carrying migrants which in the past, for lack of an alternative, involved a frigate with full crew complement, will logically fall to an AOPS on many occasions.

Much of the naval response to increased competition between and among the great powers will involve anti-submarine warfare (ASW) operations to counter the apparent anti-access strategies of powers like Russia and China. Canada will need to be able to contribute to ASW operations in a joint environment. It already has significant capability in this area; 14 of Canada's Aurora long-range patrol aircraft, which were bought in the 1980s for ASW operations, are being modernized and upgraded structurally to extend their life to about 2030, and technologically with advanced missions systems and sensors. As well, the modernized *Halifax*-class frigates have passive and active sonars and will soon be equipped with the new Cyclone maritime helicopter, containing its own advanced sonar,



Credit: Halifax Shipyard

The first two of four main propulsion diesel engines and generators are installed on HMCS *Harry DeWolf* at Halifax Shipyard, 10 June 2016.

and Canada's four diesel-electric submarines are being upgraded with "the most advanced sonar in the world,"<sup>12</sup> making them highly sought after assets in a NATO ASW context.

But there are some existing and pending gaps. In addition to the assets mentioned above, destroyers are central to ASW and until the Canadian Surface Combatant arrives Canada will not have that capability. When conducting ASW operations, Canada is dependent on its allies for refueling and supply until such time as the new Joint Support Ship arrives. A further upgrade to the *Halifax*-class to include an advanced sonar suite, identified in the 2016 Defence Acquisition Guide,<sup>13</sup> has not been funded. And, most critically, the current in-service submarine upgrade will only keep those boats operational to about 2027.

Even as open-ocean, blue-water operations increase in importance, the ability to operate from the sea on to land in the contested littoral regions of the world will remain central. Key missions include: precision strike from the sea on to land in support of allied and indigenous forces; deploying forces ashore for disaster relief; and ensuring littoral waters are 'sanitized' or free from threats so that allied forces operating there are not at risk.

The RCN has relatively limited ability to project force from sea to shore. The recent frigate upgrade includes the Harpoon Block II missile, capable of striking with precision targets up to 120 kilometres away. But the future threat environment will likely require a longer range precision missile that can strike littoral regions and engage inland targets.<sup>14</sup> The navy can get small teams ashore for intelligence gathering and to this end the *Victoria*-class submarines exercise regularly with Canadian Special Forces. But Canada does not have a class of ship that will allow for disembarking a large number of forces ashore in a humanitarian assistance or disaster relief scenario. When Canada responded to the earthquake in Haiti, for

example, it was dependent on a US ship to get its troops to shore.

Sea control is where Canada can make – and has made in the past – a critical contribution to joint operations in the littoral regions.<sup>15</sup> Projecting amphibious force requires that the littoral waters first be determined to be as free as possible from threats, and that the force itself is protected. Canada's diesel-electric submarines are particularly well-suited to the littoral mission, while its frigates can also operate close to shore to detect and defend against threats. During the Libya campaign, for example, HMCS *Charlottetown* defended NATO minesweepers that were keeping ports open for resupply. Thus while Canada does not itself have a substantial ship-to-shore capability, in the context of a joint operation it can enable allied ships to undertake shore operations. In future, once Canadian Surface Combatants and Joint Support Ships have been built, Canada's reconstituted naval task groups will be able to carry out the sea control mission independently.<sup>16</sup>

## Conclusion

Climate change and the opening Arctic, the return of great power competition, and growing instability in the littoral regions are three strategic considerations Canada should keep in mind as it recapitalizes the RCN. Important mission requirements in response include Arctic surveillance and control, contributing to measures to counter anti-access strategies, and operating in the contested littoral regions. The current National Shipbuilding Strategy is the right one for Canada in that it is focusing in the immediate term on a new surface combatant, supply ships and the Arctic patrol vessel. Yet already we can see the broad outlines of an answer to the question 'what's next for Canada's shipbuilding strategy?'

First, all trend lines point toward the increased importance of diesel-electric submarines. For Canada, these are necessary to carry out sovereignty missions in the Arctic, ASW operations in the open ocean and close to shore,



HMCS *Charlottetown* sailed for the Mediterranean to support Canadian interests in Libya 20 February 2016.





A conceptual rendering of Canada's proposed Joint Support Ship.

and additional sea control missions in the littoral regions of the world. That Canada has only four diesel-electric submarines is a limiting factor in terms of deployments. More critical is that the *Victoria*-class will come to the end of its operational life around 2027. The roughly 12 to 15 year lead times of major military acquisitions means that planning for new submarines needs to begin immediately.

Second, a related point is that after a few decades' hiatus, anti-submarine warfare has returned as a mission of central importance, both in the littoral regions and in the open ocean. Indeed, in many ways the distinction between blue and brown waters is immaterial: areas within the "first island chain," often used in reference to blue-water Chinese naval power, are "almost all littoral."<sup>17</sup> Diesel-electric submarines are imperative, but so too are frigates equipped with advanced sonars and long-range patrol aircraft. The requirement here is to fund the sonar upgrade to the *Halifax*-class frigates, as well as to advance a project to replace Canada's effective but small in number and aging long-range patrol aircraft.

Third, while the current plan is to build two Joint Support Ships with an option for a third, for operational reasons the third is *necessary*, not optional. The original proposal for a supply ship replacement, back in the early 2000s, was for *four* ships. Because such vessels must undergo maintenance after a period of deployment, with only two ships on many occasions the East or West Coast task group will, once again, be without a supply ship. Supply ships are central to the deployment of independent naval task groups, a formation that enables the navy to carry out all tasks – from humanitarian operations to anti-submarine warfare to sea control – more effectively.

In the longer term Canada will want to take into account the need for an independent ability to embark forces from ship to shore. Until such time as Canada has a vessel that can deploy a large contingent of forces ashore (the navy calls this a peace support ship<sup>18</sup>), it will remain dependent on allies for its ability to contribute in a major way to humanitarian assistance and disaster relief operations. Finally, out a few decades, after the Canadian Surface Combatant, and as the ice continues to melt, we can anticipate the requirement for a follow-on to the Arctic Offshore Patrol Ship. Additional ships will be needed to conduct the surveillance and control of Canada's three

ocean approaches, especially the Arctic.

All of these capabilities can be planned for now and anticipated in the next iteration of the National Shipbuilding Strategy. Had the current strategy been launched in 2000 instead of 2010 then there would have been a smooth transition from the platforms and capabilities of the 1980s and 1990s to those that are needed now to 2050. If the government acts expeditiously to initiate these new programs, then in 15 years – unlike today – we will be able to witness a seamless move to Canada's future fleet. 🇨🇦

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# Canada's Submarines are Sunk Costs

Michael Byers



Credit: Jacek Szymanski, Navy Public Affairs, RCN

*HMCS Victoria transits in the vicinity of Esquimalt, BC, during sea training trials and exercises, 20 February 2012.*

Imagine spending \$50 on a concert ticket, then learning that your friends are organizing a party for the very same evening. If you are like most people, you will go to the concert, even if you would probably enjoy the party more. An economist, however, would advise you to attend the party – because the \$50 is gone regardless of what you do. Decisions about maximizing benefits should be taken within the context of present conditions, not past ones.

The human tendency to allow current decisions to be influenced by past expenses is called the ‘sunk cost fallacy.’ It is one reason – perhaps the main reason – why successive Canadian governments have spent billions of dollars trying to refit and repair four second-hand submarines built for the British Royal Navy three decades ago, instead of purchasing new ones.

It is time to reject the sunk cost fallacy, and either buy new submarines or shut the program down altogether.

## **Warning Signs and Digging Deeper**

There were numerous warning signs when Canada bought the submarines in 1998, including a suspiciously low price of \$750 million – less than one-quarter of the estimated cost of \$3-5 billion to purchase four new vessels.<sup>1</sup> Another warning sign was that the submarines were also offered to Chile, Greece, Pakistan, Portugal, Saudi Arabia, South Africa and Turkey, none of which decided to buy them.<sup>2</sup>

The British government had built the diesel-electric submarines between 1986 and 1993 and named them the *Upholder*-class. It was a difficult procurement, with a litany of problems pushing up costs and ultimately prompting a

review by the Defence Committee of the British House of Commons. For example, shortly after the construction of the first vessel, HMS *Unseen* (now HMCS *Victoria*), it was discovered that the torpedo tube slide-valve, which controls the torpedo tube doors, could malfunction and allow the inner door to be opened while the outer door was ajar, thereby allowing water to flood into the submarine.<sup>3</sup> HMS *Unseen* first went to sea unable to fire its main weapons, with the outer torpedo tube doors having been welded shut for safety reasons.<sup>4</sup>

The second submarine, HMS *Upholder* suffered a loss of power during an emergency reversal test due to malfunctioning main-motor control circuitry. The Paxman Valenta diesel generators, which are still used in the vessels, were intended for railroad locomotives and not for the abrupt stops and starts required of submarines during manoeuvres or combat.<sup>5</sup>

After the submarines were decommissioned by the Royal Navy in 1994, they languished in a Scottish loch for four years awaiting a buyer, and another two to six years before Canada actually took possession of them. HMS *Upholder* (now HMCS *Chicoutimi*) spent a total of nine years in saltwater storage, while the other vessels spent between four and six years. In 2005, the Canadian House of Commons Standing Committee on National Defence reported that, “except for the electrical power fed from shore to demonstrate the electronic systems to prospective customers, the vessels were just soaking up the sun and the salt water.”<sup>6</sup> The vessels suffered serious corrosion, necessitating repairs and refits that contributed to later



delays. One of the submarines, HMCS *Windsor*, remains subject to diving depth restrictions to this day.<sup>7</sup>

Other problems emerged after Canada took possession. Some of the problems were due to the shortage of preventative maintenance, others to the old technologies used in the submarines, and others due to poor construction. In 2004, a fire broke out on HMCS *Chicoutimi*, causing one death. The fire was caused by sea water infiltrating through an open hatch, leading to an electrical short, but the water was only able to cause the short because the wiring system had just one layer of waterproof sealant, instead of the three layers the construction specifications required.<sup>8</sup>

That same year, the electrical systems on HMCS *Victoria* suffered “catastrophic damage,” according to an article by Chris Lambie in the *Halifax Chronicle Herald*.<sup>9</sup> As Lambie explained, “[t]he navy had a new \$1-million piece of equipment that was supposed to supply the sub with direct-current power while it was at dockside,” instead, it destroyed many of the submarine’s electrical components.<sup>10</sup> After the accident, the navy spent “about \$200,000 to buy old technology that mirrors what the sub’s British builders used,” equipment one of the navy’s own “electrical technologists” said “probably goes back to the ’60s.”<sup>11</sup> The submarine spent the next six years undergoing repairs.<sup>12</sup>

In 2012, HMCS *Windsor* completed a five-year refit that was initially scheduled to take two years. Numerous problems were discovered during the course of the refit. According to documents obtained by the CBC, “[i]t appears that every system ... has major problems ... including bad welds in the hull, broken torpedo tubes, a faulty rudder and tiles on the side of the sub that continually

## A shortage or lack of spare parts has posed an ongoing challenge.

fall off.”<sup>13</sup> Not surprising, the refit ran far over budget – in 2010 alone the navy spent \$28 million more on the vessel than the \$17 million allocated.<sup>14</sup> Then, in 2012, a defect was found in one of the vessel’s two diesel generators, which resulted in the submarine having to operate on just one generator.<sup>15</sup>

A shortage or lack of spare parts has posed an ongoing challenge. As Commander R.E. Bush, the project director for the *Victoria*-class program, explained in 2005, “many of the original equipment manufacturers either no longer manufacture the equipment, or have moved on to other designs.”<sup>16</sup>

As a result of these and other problems, Canada’s four submarines have spent most of their lives being refitted and repaired, leaving little time for training and operations. In the decade between 2003-2013, they accumulated a total of just 1,277 days at sea.<sup>17</sup>

In the mid-1990s, the government of Prime Minister Jean Chrétien “considered getting out of the submarine business altogether.”<sup>18</sup> In 2007, the Stephen Harper government also considered scrapping the *Victoria*-class submarines.<sup>19</sup> On both occasions, proponents of the submarine program would have pointed to the large amounts of money that had already been spent; money that would be wasted if the program was closed down.

The Harper government, persuaded that it should stick with the program, awarded the *Victoria*-class in-service



HMCS *Chicoutimi* arrives at Esquimalt, British Columbia, for refit work following a fire on the submarine’s initial voyage to Canada in 2004.

Credit: Cpl Chris Ward, Imaging Services, CFB Esquimalt



HMCS *Windsor* is lowered into the water from dry dock after undergoing a five year refit at CFB Halifax, Nova Scotia, 11 April 2012.

support contract to the British-based company Babcock International in 2008. The contract was worth up to \$1.5 billion over 15 years.<sup>20</sup> Several years later, the government added \$200 million to the contract, bringing it to \$1.7 billion.<sup>21</sup>

By 2012, however, the Department of National Defence was concerned that the Harper government might terminate the submarine program for cost-savings reasons.<sup>22</sup> The sunk costs argument may have been invoked again, and the program continued. Then, after the October 2015 election, defence officials persuaded the government of Justin Trudeau to add another \$900 million to the contract with Babcock International, bringing the total – for 2008 to 2023 – to \$2.6 billion.<sup>23</sup> Now, according to an article by Lee Berthiaume in the *Ottawa Citizen*, the navy “is waiting to hear whether the government wants to extend the submarines’ lives so they can operate until the 2030s.”<sup>24</sup> This decision, which needs to be made soon, would require an additional \$1.5 to \$3 billion.

### **It would not be fair to blame the Royal Canadian Navy for the ongoing problems with the *Victoria*-class submarines.**

The whole situation is quite remarkable, especially when you consider that the four submarines are now 24-27 years old, and only one is currently available for immediate deployment. That submarine happens to be HMCS *Windsor*, with its restricted diving depth and other ongoing mechanical problems. Most recently, the crew of HMCS *Windsor* was forced to abort a voyage to an exercise near Norway in August 2016, returning to Halifax for a week of repairs.<sup>25</sup>

The situation is even more remarkable when you consider that, for less money than has been spent refitting and repairing the *Victoria*-class submarines in an effort to

make them fully operational, the Chrétien or Harper governments could have procured at least three brand new submarines from proven manufacturers in Germany or France. The new submarines would have been cheaper to maintain, and been much more reliable, and they could have included useful new technologies such as air independent propulsion for operations under Arctic sea ice.

It would not be fair to blame the Royal Canadian Navy (RCN) for the ongoing problems with the *Victoria*-class submarines. In a recent article in the *Naval War College Review*, Jan Joel Andersson explains that “it is very difficult and costly to operate submarines safely and even more difficult to create and sustain a submarine force capable of conducting effective combat patrols.”<sup>26</sup> As a result, “[m]any of the world’s navies are finding it hard to maintain and service their submarines properly or even to recruit and retain qualified personnel, and these services have little opportunity to conduct enough patrols to give their crews the operational experience necessary to deploy effectively.”<sup>27</sup> Andersson provides a long list of developing countries with old, difficult to maintain and, for the most part, non-operational submarines. He also notes that even Canada’s peers have troubles with their submarine fleets. For example, he notes:

The Royal Australian Navy (RAN) currently operates six Swedish-designed *Collins*-class submarines that were coproduced in Australia and commissioned between 1996 and 2003. These boats, among the largest and most advanced conventional submarines in the world, have suffered from persistent maintenance problems that have resulted in reduced availability and opportunities for crew training. The RAN’s stated goal is always to have two submarines deployed or available for immediate deployment, two in training, and two in maintenance. However, this goal has reportedly never been achieved; the navy has at times been left with only one operational submarine, sometimes none at all.<sup>28</sup>

However, the challenges facing the RCN have been exacerbated by the political decision, made nearly two decades ago, to provide them with these particular cut-price, second-hand, poorly built and maintained submarines.

### ***Options for the Future***

Elsewhere, I have acted as devil’s advocate by challenging the arguments in favour of retaining Canada’s submarine capability.<sup>29</sup> Good decision-making is facilitated by a rigorous contestation of ideas and analysis, something which is often lacking in the hierarchical worlds of national defence





Royal Australian Navy Collins-class submarine HMAS *Dechaineux* leads HMAS *Waller* and HMAS *Sheean* in formation from Fleet Base West HMAS *Stirling*, 22 March 2013.

and Westminster-style government. How many Canadian politicians know, for instance, that Denmark decommissioned its submarines in 2006, choosing to strengthen its surface fleet instead? Like Canada, Denmark is a NATO member with a very long coastline, due to its responsibilities to control and defend Greenland's coasts as well.

However, there are also good arguments in favour of Canada retaining a submarine capability, including the fact that it has the world's longest coastline. My concern is that Canada will lose its submarine capability through negligence rather than design, as successive governments stave off the necessary decision on whether to purchase new submarines.

One should not underestimate the political inertia which exists on this file. In addition to the sunk costs argument, politicians know that refitting old military equipment avoids the public controversies that accompany major new purchases. Why would the Trudeau government want to repeat the travails involved in replacing the Sea King helicopters or the CF-18 fighter jets when it could, instead, quietly put more money into refitting and repairing the *Victoria*-class submarines?

Instead of hiding behind another round of refits, the government should face up to the fact that Canada's submarine capability is running out of time. As Chief of Maritime Staff Paul Maddison told the Senate National Security and Defence Committee in 2012: "I would envision initiating a next-generation submarine discussion within the next three or four years to ensure there is no gap in submarine capability, which is what we faced in the 1990s."<sup>30</sup> In other words, a decision is urgently needed. Does Canada purchase new submarines? Or does it, like Denmark, get out of the submarine business altogether?

A prompt and efficient procurement should be facilitated by the fact that there are only a few options available for

new diesel-electric submarines. The first option is the *Scorpene*-class. This class of submarine was designed by France's DCNS and Spain's Navantia. A proven design, the *Scorpene*-class is currently in service in the French Navy and is being acquired by other countries, including Chile, Malaysia, Brazil and India. It has a top speed of 20 knots submerged and a diving depth of around 350 metres. The *Scorpene*-class has a range of 6,500 nautical miles (12,000 km) and, with its air independent propulsion (AIP) system, can remain submerged for up to three weeks.<sup>31</sup>

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**My concern is that Canada will lose its submarine capability through negligence rather than design, as successive governments stave off the decision on whether to purchase new submarines.**

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As with any naval ship, the cost of the *Scorpene*-class depends on the equipment and armaments placed on board. Malaysia paid between 390-400 million Euros for each of its *Scorpenes*, Chile paid 400-460 million Euros, and India paid 750 million Euros.<sup>32</sup> At the current exchange rate of 1.39, these figures work out to CAD \$542-556 million, \$556-639 million, and \$1.042 billion.

The second option for Canada is the U-212/214. Germany's U-214 submarine is the export version of the U-212. A product of Thyssen Krupp Marine Systems, it has been purchased by Portugal, Greece, South Korea and Turkey. The U-214 has a maximum speed of 20 knots, a maximum depth of about 400 metres, and a range of 10,420 nautical miles (19,300 km). Its AIP system provides a submerged endurance of two weeks.<sup>33</sup>

The U-214 lacks the non-magnetic steel hull that makes the U-212 (the non-export version) impossible to detect



Malaysia's first *Scorpene*-class diesel-electric submarine docked at its naval base in Port Klang on the outskirts of Kuala Lumpur, 3 September 2009.



Credit: Ulrich Wrede/  
www.primeportal.net

U-32 is the second Type 212A submarine of the German Navy. The Type 212 features diesel propulsion with an air independent propulsion system using hydrogen fuel cells.

using a Magnetic Anomaly Detector. If Canada were to purchase the German-designed submarine, it might wish to negotiate for the inclusion of the non-magnetic technology. The cost of a U-212, with the non-magnetic hull, is around \$500 million.<sup>34</sup>

The third option is the *Shortfin Barracuda*. In 2016, Australia decided on this new model which is a diesel-electric version of the *Barracuda*-class nuclear submarine produced by French company DCNS. The *Shortfin Barracuda*, which exists only as a design, will be relatively large and long-ranged for a conventionally-powered submarine, at 97 metres in length and with the ability to sail 18,000 nautical miles without refueling.<sup>35</sup>

However, the *Shortfin Barracuda* will be very expensive, with the Australian government expecting to pay AUS \$50 billion for 12 of the new vessels.<sup>36</sup> As a point of comparison, Thyssen Krupp Marine Systems offered to build the same number of U-216s (a larger version of the U-212) in Australia for AUS \$20 billion.<sup>37</sup> Even a fleet of *Virginia*-class nuclear-powered attack submarines would cost less than the *Shortfin Barracudas*.<sup>38</sup> This cost factor alone probably rules the Australian choice beyond consideration for Canada.

## Conclusion

When it comes to the *Victoria*-class submarines, the sunk cost fallacy has prevented clear-headed decision-making for nearly two decades. Canada bought the submarines, paid billions of dollars to fix them, and cannot allow that money to go to waste. Or so the thinking has gone.

Those decades of clouded thinking have left Canada – a wealthy, developed, G7 country – with a sad little fleet of broken-down submarines. It is time for bold, evidence-based decision-making. It is time to either buy new submarines, or shut the program down. 🍷

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# The Navy's Prospects in Trudeau's Defence Policy Review

Dave Perry

After difficult years, a decade of naval darkness, the Royal Canadian Navy (RCN) is facing a significantly brighter future. Following years of far lower than normal operational surface fleet availability, the modernization and life extensions of the *Halifax*-class frigates are now finished. Similarly, the *Victoria*-class submarines are finally operating as their proponents had originally hoped. After years of uncertain prospects for fleet recapitalization, the National Shipbuilding Procurement Strategy (NSPS) was embraced and rebranded as the National Shipbuilding Strategy (NSS) by the government of Justin Trudeau.

The future, therefore, is far brighter for the RCN than it has been in some time. Yet, at the same time, the Defence Policy Review is a potential inflection point for the Canadian Armed Forces as a whole, and a point of significant concern. Unless the defence budget is increased, the Department of National Defence (DND) will be faced with some difficult choices, as the existing long-term plans are significantly underfunded. At the same time, the Trudeau government faces an economic situation weaker than the one it inherited, with ongoing projections of weak economic growth and growing budgetary deficits. The RCN's current prospects are therefore cause for cautious optimism, and the navy appears well positioned with the Trudeau government – the Canadian Armed Forces overall, however, are vulnerable.

## The Federal Government Context

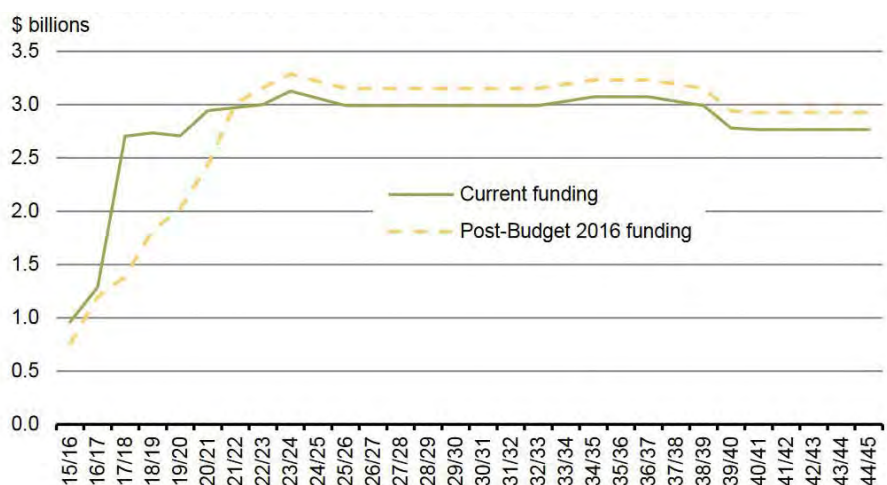
As 2016 drew to a close, DND submitted the Defence Policy Review for Cabinet consideration. This happened at a difficult time for the Trudeau government. Having entered the 2015 election campaign in third place, the government made literally hundreds of promises in its campaign platform. After spending much of its first year consulting on dozens of issues, it must now actually make decisions, and do so within very limited fiscal room. As the government's first summer in office came to a close, it became clear that limited budgetary resources would negatively affect its ability to meet both the promises and the expectations the Liberal Party had set during the campaign. The 2016 Fall Fiscal Update from Finance Minister

Bill Morneau showed that economic growth was weaker than forecast in the 2016 budget and will continue to be so in the future.<sup>1</sup>

**The RCN's current prospects are cause for cautious optimism, and the navy appears well positioned with the Trudeau government – the Canadian Armed Forces overall, however, are vulnerable.**

It was also made clear to the public that additional resources outside of the government's core policy areas will not be forthcoming. Indeed, it appears that further resources for the Ministers of Environment and Health are unavailable as well, a surprising fact given the importance of each portfolio to the government's agenda and Canadians' concerns.<sup>2</sup> These economic forecasts and fiscal pressures have led the government to consider creating a public-private partnership for infrastructure in an attempt to stimulate more favourable economic growth.<sup>3</sup> Such an unorthodox proposal would doubtless not be under consideration if economic prospects were better. In sum, before the government started to consider defence policy, the Finance Minister made clear that economic prospects were getting dimmer and that additional public

## Funding for national defence large-scale capital projects



Notes: The annual profile of this funding may be subject to change depending on project schedules.

Figures do not include ongoing core funding in National Defence's annual budget for smaller capital projects and one-time funding for other capital (e.g., Budget 2016 federal infrastructure initiative).

Funding for large-scale capital acquisitions is reflected in National Defence's Estimates when authority is sought to appropriate cash for a given purchase.

Source: Department of National Defence with Department of Finance calculations.

*An old political trick: reduce capital funds in the short term, but promise more capital spending in the future.*

Credit: Canada, Budget 2016, p. 203

funds beyond the considerable deficit spending already promised are in short supply, even in policy areas of key importance to the government.

Set against that background, DND's Defence Policy Review will likely be received by a Cabinet already inundated with funding requests the Finance Minister is unable to fulfill. The time is thus not auspicious to present the government with a significant ask for additional funds, especially outside of core policy areas. Although none of the details related to the Defence Policy Review submissions have been made public, it is safe to assume that at least one of the options presented to government would require a budget increase.

Public documents suggest that the capital equipment budget alone is short by roughly \$2 billion a year over the long term, given extant policy commitments. In addition, the department is short by several thousand positions according to the 2011 Report on Transformation. Based on these two facts alone, at least \$2 billion annually would be required simply to allow DND to resource a status quo defence force structure. Given the direction outlined in the Minister of National Defence's mandate letter, however, the Trudeau government does not appear to be interested in a status quo defence policy. The imperatives of bringing Canada 'back' in defence policy terms suggests far more than maintaining the status quo, given the government's direction to return to United Nations peace support operations, enhance the surveillance and control of approaches to Canada, improve the treatment of Canadian military personnel, and deliver on the results of a parallel cyber review.<sup>4</sup>

And these mandate letter pledges all came before the 22 November announcement that Canada would acquire an interim fleet of 18 Super Hornet fighter jets while also completing a competition to replace the fleet permanently within five years. The capital equipment funding required to make the interim fighter purchase will likely run to several billion dollars on its own, and the costs of staffing, training and supporting two fleets of fighter aircraft several more, none of which was included in the defence budget. Similarly, the Minister of National Defence has stated that the same 'capability gap' leading the department to acquire an interim fleet of jets will also lead it to purchase more than the previously planned fleet of 65 aircraft. The major decline in the value of the Canadian dollar over the last few years on its own had made the previous budget set aside to buy a fleet of 65 fighters dubious at best – increasing the buy beyond 65 jets will require more money.<sup>5</sup>

But set against these plans, and a funding deficit, the



Canada will purchase 18 F/A-18F Super Hornets as an interim measure to replace its current CF-188 fleet.

Defence Minister's mandate letter only directed him to *maintain* defence funding, including planned increases. While the policy direction provided to DND by the government to date will require increased resources, there has been no commitment to increase the defence budget. Further, and more problematic, set against the demands of other government departments (which are likely to be substantial), DND's demands for additional funding are massive. DND tends to discuss its budget in international or historical comparison. By these measures, defence funds have declined in real terms over the last several years, and the Canadian defence budget is paltry, measured as a share of Gross Domestic Product.

Nonetheless, DND consumes by far the largest share of the federal budget devoted to actual federal program spending, and is the third largest in government after the Departments of Finance and Employment and Social Development Canada which primarily transfer funds to other levels of government and make interest payments. Under the currently planned increases built into the status quo defence budget, the department will receive an increase to its operating budget next year of \$552 million. If that increase were treated as a standalone departmental budget in its own right, it would be larger than all but 41 of the federal government's other departments and agencies. If the additional \$2 billion needed to eliminate DND's capital equipment funding deficit were treated as a standalone departmental or agency budget, it would be the 16<sup>th</sup> largest in government.<sup>6</sup>

Given the sheer size of the DND budget, even modest increases to defence spending are comparatively enormous across the government of Canada. Simply honouring the commitment to maintain the defence funding status quo by increasing DND funding by 3% starting 1 April 2017 will mean giving DND a huge budget increase (the aforementioned \$552 million increase) that reduces significantly the funding available for other government departments. Even if Prime Minister Trudeau were personally inclined to support even the funding increase required to maintain a status quo military, it would remove at least \$2 billion in funding from the pool available to the



28 other members of the federal Cabinet. Given the heavy focus of the government on socio-economic issues, it is not apparent that the inclination to provide more funding for defence is there even if the federal budget were not already well into deficit.

While the prospects for defence writ large are dim, those for the RCN are more promising. In its election platform, the Liberal Party of Canada promised to make the navy a priority and it has subsequently made good on that promise. One of the first acts of the new government was to sign the contract for the Interim-Auxiliary Oiler Replenishment ship. Shortly after, it announced that it was revisiting the procurement strategy for the Canadian Surface Combatant (CSC), with the intent of delivering new ships faster and with less risk. Afterwards, the government announced enhancements to the National Shipbuilding Procurement Strategy launched by the Conservative government, and embraced it under the rebranded National Shipbuilding Strategy (NSS).

Credit: Project Resolve/  
Federal Fleet Services

*MV Asterix, a commercial vessel that is being converted into a supply ship for the Canadian Navy, at Quebec's Chantier Davie shipyards, 23 June 2016.*

The proposed enhancements to the NSS include increasing staff capacity, introducing better costing and providing better communications. These measures are sound, although evidence of their expeditious introduction has been difficult to find. In the summer of 2016, the Request for Proposals (RFP) for the in-service support contract for the new class of Arctic Offshore Patrol Ships and the Joint Support Ship (AJISS) was released. And then in October, the RFP for the Canadian Surface Combatant was released. On its own, the release of the CSC RFP would have been an impressive record of accomplishment for the government's first year in office. The Trudeau government deserves credit for the complex work of getting the bid documents prepared and out the door, and the Harper government deserves credit for putting in place the NSPS



*HMCS Toronto in Halifax Harbour on 29 November 2016 following the completion of the refit portion of its modernization.*

structure that made it possible and doing the crucial planning work that led up to the release of the RFP. Taken together, these announcements reflect serious support from the Trudeau government for naval procurement.

This support also comes at a time when the RCN is once again able to offer government decision-makers far more options to support Canadian international policy than it has over the last several years. The most significant development in this regard is the completion of the *Halifax-class* Modernization/Frigate Life Extension (HCM/FELEX) project. At the end of November 2016, HMCS *Toronto*, the last frigate to go through the upgrade at Irving Shipbuilding, was returned to the fleet, on schedule. After a lengthy period of being able to keep only one ship deployed abroad at a time, Canada now has its surface fleet back. Coupled with the new innovation of 'generating forward' this is providing the Trudeau government with far more possibilities to use the surface fleet as a tool of Canadian policy than Harper had in the latter half of his time in office.

Similarly, after a far too lengthy period of introduction, and more than one false start, Canada now has an operational submarine fleet. In the last two years, HMCS *Windsor* alone logged nearly 400 days at sea. More importantly, over the last couple of years, the *Victoria-class* boats have moved from participating in counter-drug exercises off the coast of Central America, to engaging in counter-submarine activities. In the fall of 2015 *Windsor* participated in NATO exercises Trident Juncture and Joint Warrior, and in 2016 Cutlass Fury off the coast of Halifax and then the NATO Exercise Dynamic Mongoose in the Norwegian Sea.

After the conclusion of the exercise, at NATO's request the boat was retasked to conduct an actual operation. While operational details remain classified and have not been released, it seems likely that the operation was an anti-

submarine activity directed against Russian submarines. Upon *Windsor's* return to Halifax, the RCN noted that the boat's bow ring has now been painted blue, indicating it has operated in Arctic waters, and suggesting it was engaged in the strategically important portion of the northeastern North Atlantic where the Russian fleet at Murmansk accesses the wider Atlantic Ocean.

### ***The Navy in the Defence Policy Review***

The fleet's return is propitious as it reintroduces naval capability just in time for the Defence Policy Review. The review itself is unlikely to be made public until after the 2017 budget – indeed, anyone hoping that the new defence policy will have additional funding to rectify some of the resource gaps in the Canadian Armed Forces should hope that the review is not released until after the 2017 budget. If the new policy is released before a new budget line is set, that would indicate that the policy is fiscally neutral. DND went into the review with several deficits, the deficit for capital equipment funding the most significant of these, but those for infrastructure and personnel were meaningful as well. Without a substantial injection of new funding, the new defence policy, irrespective of its actual text, will be one that results in armed forces with reduced capacity.

From that starting point, some key aspects of how the review has unfolded provide indication of its likely structure. The review engaged in extensive public consultations resulting in more than 25,000 submissions. At the expert roundtables alone, the diversity of thought amongst the invited experts was such that it is doubtful that much useful policy direction could have been discerned from the consultative process. From the wider group of respondents,

the government surely received every conceivable recommendation imaginable. The public consultations were therefore likely not much help in shaping the review, leaving the process to be built as a bottom-up process within DND, led by the Policy Group.

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**Without a substantial injection of new funding, the new defence policy, irrespective of its actual text, will be one that results in armed forces with reduced capacity.**

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Further, true to the government's maxim of returning to the principle of Cabinet-led government, DND was left to draft the policy effectively on its own. While that provided the benefit of allowing an articulation of the best professional defence advice, it had two distinct disadvantages. First, the review was not grounded in an appreciation of the fiscal room available to the department. On one hand, this allowed the review to go forward without being constrained by a predetermined understanding of what was possible. On the other hand, the proposals put forward were developed without an understanding of whether they could be realized based on the allocations in the budget. The second disadvantage of this approach was that rather than writing a policy under government direction, DND has written a policy document and now has to hope that the government likes it. Taken together, this has increased the likelihood of a departmental policy that is not embraced by the government. In sum, there is significant cause for concern about the government's overall policy direction.



*HMCS Windsor returns to Halifax from Exercise Dynamic Mongoose 2016, a NATO anti-submarine warfare exercise in the Norwegian Sea, 9 August 2016.*





Credit: U.S. Navy Mass Communication Specialist 1st Class Steven Myers

*Will Canada replace its current submarines? HMCS Corner Brook (SSK 878) arrives at US Naval Submarine Base New London for a scheduled port visit, 16 August 2010.*

Once again, though, there is some room for optimism for the RCN. The Minister of National Defence has spoken repeatedly about the need for Canada to gain a greater understanding of theatres of operations before military forces are deployed, and the benefits of intelligence collection. Similarly, he has also discussed the value of engaging earlier in the conflict cycle and in participating in conflict prevention activities. This inclination from the Minister is entirely in line with key tenets of maritime policy, including naval diplomacy and traditional roles of navies in supporting the status quo movement of goods on the high seas, and in providing forward presence capable of collecting intelligence and providing scalable responses.

More generally, the RCN would appear to be one of the few areas where Canada has the capacity, within existing resources, to take on any additional activity. With significant land-based operations already underway or planned in the Middle East, Eastern Europe and Africa, there is likely little additional capability to undertake further land operations in the near term. Royal Canadian Air Force support to these three lines of operations will similarly tax much of Canada's air force. The gaps identified by the Defence Minister in Canada's fighter capability, and the need to introduce a new fleet of Super Hornets, will further restrict the use of Canada's fighter fleets. Assuming the government would like the Defence Policy Review to launch initiatives they have not already announced (like the much-awaited United Nations operation), the RCN would seem poised to be the focal point of a new policy by default. Enhancing Canada's maritime presence in Asia would seem a likely new initiative.

Hopefully, one area where the Defence Policy Review announces something new is the future of Canada's submarine fleet. Submarines have not been explicitly mentioned

in a formal Canadian defence policy since the 1994 White Paper. The consultation paper issued by DND ahead of the review did at least mention submarines, if only to list them as an existing Canadian military asset. Strategically, submarines are more relevant now than they have been in decades. The Indo-Pacific region is in the midst of a veritable sub-surface arms race, and Russian submarine activity in the Atlantic has reached levels not seen since the Cold War. For both Canadian and continental defence, as well as wider expeditionary operations, retaining this capability should be a focus of the review. Hopefully this will entail at least providing funding to extend the life of the *Victoria*-class boats in the medium term, and directing the RCN to explore replacement options in the long term.

As Canadians wait to see the new defence direction of the Trudeau government, the situation as a whole for defence does not leave much room for optimism. But both government expressions of intent and available military capabilities give room for cautious optimism for Canada's navy in 2017. 🇨🇦

#### Notes

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# Making Waves

## *The Need for Maritime Thinking and Sea Power*

Peter Haynes

Dealing with problems associated with operating and building a fleet can be so self-absorbing that one could miss how changes in the strategic environment are increasing the need for maritime thinking and sea power in general. Unfortunately, Western navies are not well disposed to understand and relate the broader implications of those changes to naval purpose – which of course must be defined before embarking on efforts to redesign and recapitalize the fleet. In terms of time and talent, the focus is on finding high-tech solutions to operational-level problems. In these naval institutions, that which is learned and inculcated is limited to that which is useful in the context of naval operations.<sup>1</sup> While strategic and economic history is not thought to be of much use, it is precisely the kind of knowledge needed to understand such implications and think in maritime terms.

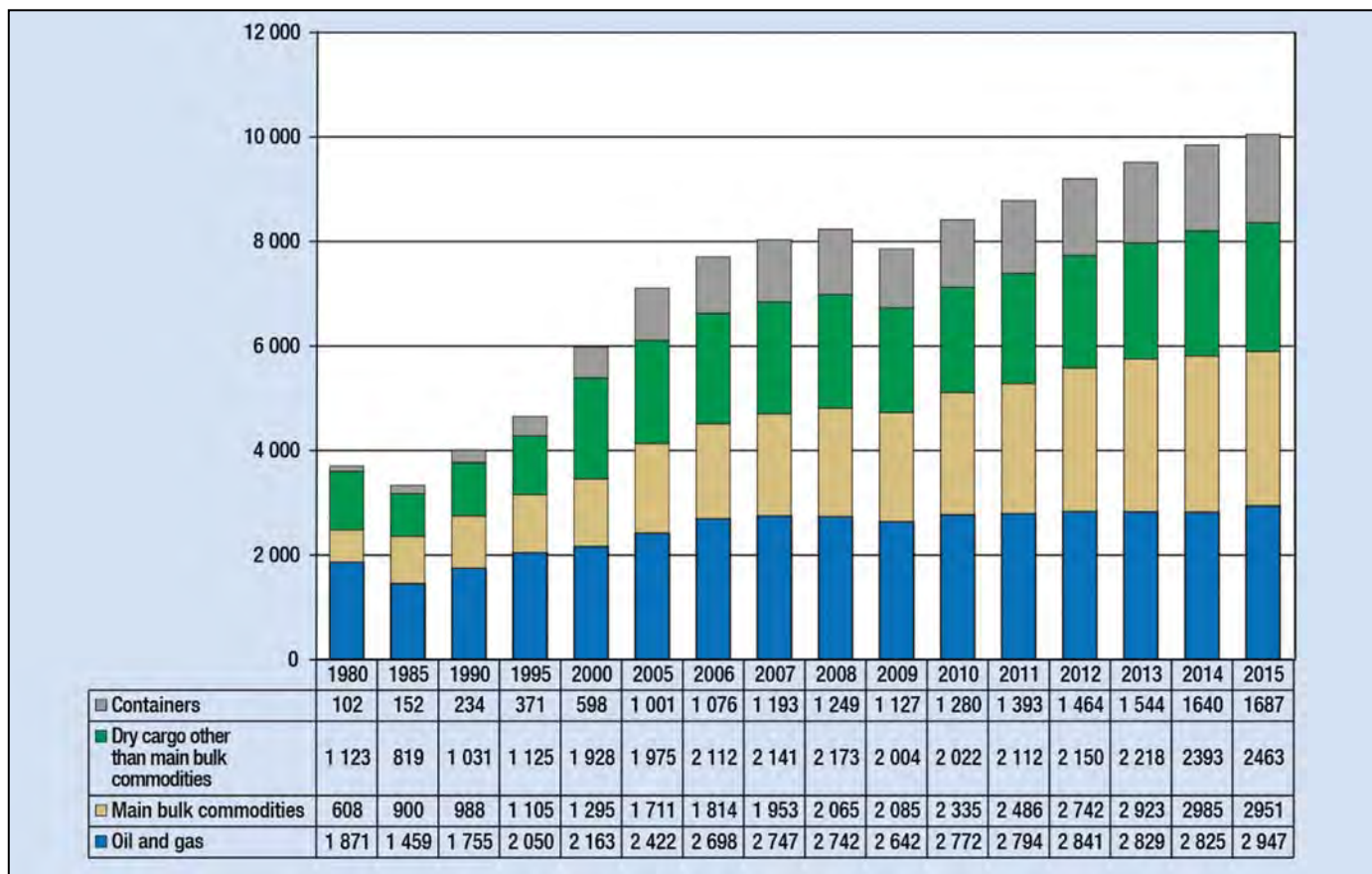
But what does it mean think in maritime terms? Naval strategy is about employing seaborne military force for

political purpose. Maritime strategy expands the calculus beyond military interests to encompass and interrelate economic, political and military interests. Unlike those associated with land or air power, maritime strategy has always concerned itself with the relationship between the state and global markets.<sup>2</sup>

Maritime thinking therefore requires an understanding of how the global economy functions. It requires understanding the adversary's economic, political and military and naval strengths and vulnerabilities in light of one's own. It is about how to use the naval instrument to accumulate and distribute wealth among allies and prevent the adversary from doing so.<sup>3</sup> Practically speaking, maritime strategy is about ensuring access to resources, markets, supply chains, lines of production, capital, partners and battlefields – as well as denying the enemy the same.

So, why is the need for maritime thinking so compelling? It begins with globalization – the defining characteristic of the strategic environment. As was the case during the last era of globalization, which the First World War extinguished, globalization shifts the security calculus toward a greater emphasis on economics, which is the cornerstone of any maritime strategy.

**Figure 1: International Seaborne Trade, Selected Years (Millions of tons loaded)**



Source: UNCTAD Review of Maritime Transport, 2016, p. 7.





Past or present, globalization is brought about by the expansion of the global economy and the global integration of trading and financial systems. It is driven by a revolution in telecommunication and transportation technologies, the spread of Western rationality, norms and culture, and the adoption of free-market economies. All of this enables vast movements of trade, capital, information and ideas. Globalization increases interdependencies between states, thereby inextricably linking economic and political interests. It makes states less self-sufficient and more dependent on trade.

As in the case of Wilhelmine Germany (which existed between 1890 and 1918) and the United States in the last era (roughly 1840s to 1914), and China in the current, globalization helps elevate some states to great power status. Globalization brings about great power competition and increases the sources of conflict between these powers. It fuels the aspirations of powers like Germany and China and their efforts to challenge the world order. Globalization reconfigures the balance of global power, shifting relative power away from the status quo powers to the rising ones. All of this makes for a mutually vulnerable and more negotiated and multi-polar world.

In an era of globalization, the locus of strategic attention shifts not only to economics, but offshore as well. Globalization is marked by fierce competition for global markets, far-flung resources (particularly energy, labour and food) and influence. It is characterized by the efforts of rising powers to construct globe-spanning commercial empires, financial institutions and the wide-ranging naval forces necessary to protect those economic interests. Overall, it is characterized by an appreciation that trade, as Dan Moran and James Russell note, is “a crucial source of political power, and of explicit or implicit strategic leverage.”<sup>4</sup>

Since world trade is essentially maritime trade, competition to ensure access to markets, resources (particularly capital and petroleum) and information (much of which flows via undersea cables) will intensify in peace and will be heavily contested in war. In such an era, financial and naval power come to the fore. As the economist Julian Snelder notes, since “oil and U.S. dollars are the most important resources in the world today, the two branches of the U.S. government that other nations fear the most are the Navy and the Treasury Department.”<sup>5</sup>

Globalization ushers in the possibility of great power conflict – sweeping in its costs and consequences to world order. As was the case with the First World War,

such a conflict threatens the collapse of the international political and economic system. This system, the rules, regimes and institutions of which were largely designed by the United States, is the well-spring from which the United States – as well as its allies and trading partners, particularly China – draws its power, influence and ability to provide for and defend its way of life, its homeland and the system itself.<sup>6</sup> Since 1945, this system has brought unprecedented prosperity and freedom to ever-expanding parts of the world. Once destroyed, as it was after the First World War, it takes much longer to rebuild. Ostensibly, it is in the interest of every state to prevent great power war.

Globalization, however, brings the seeds of its own undoing. States are taking steps to reduce their dependencies and insulate their societies. Some are rejecting free-market ideals by cornering markets and resources and embracing the type of ‘beggar thy neighbour’ policies of the 1930s that helped usher in the Second World War. In a deglobalizing world, the drive for short-term self-interested gains will only increase.

Regardless of where globalization might lead, however, it is well to remember that it is in the context of great power war that navies exert their greatest strategic leverage. As Moran notes, “[t]he surest path to victory in any global conflict ‘hot’ or ‘cold’ is to conduct yourself so as to insure that the rich countries and critical resource areas of the world end up on your side. This has been the essence of maritime strategy since the Age of Sail, and there is no reason to expect the pattern to change any time soon.”<sup>7</sup> The more protracted the conflict and the more one can leverage its industrial capacity, the more decisive sea power becomes.

Unfortunately, the United States and its allies and their respective navies have not thought deeply about great power competition and what such conflict might look in an interdependent world. This should not be surprising. How the United States and the US Navy adapted to the immense challenges of the Cold War did not compel a need for either to think in maritime terms.<sup>8</sup>

Unlike Wilhelmine Germany and China, the Soviet Union’s economy was not integrated into the global economy. Unlike the British Admiralty and British leaders before the First World War, neither the US Navy nor the leaders of the United States, which was not dependent on trade for food and capital, gave much thought to how to use the naval instrument to enervate Soviet economic strength *and* insulate the West’s economy. They had little need to think about not just blockade but more broadly how to

use that instrument against the mechanisms of Soviet economic and financial power. They did not need to consider how their decisions might affect the economic well-being of US allies and key neutral trading partners, whose support affects how and to what extent they can prosecute particularly a protracted war.

During the Cold War, the United States and NATO did not think deeply about how to win a protracted war; the emphasis was on *detering* war. Unlike the British example before the First World War, there was no need to understand how to wage war without inviting mutually assured economic destruction or how their decisions might affect international trade, the stability of the global economy, and the sustainment of the world order.



China's first, and so far only, aircraft carrier, *Liaoning*, passed through the Taiwan Strait accompanied by a fleet of escorts, early 10 January 2017.

The fact that NATO-Europe shared borders with the Soviet Bloc meant that the locus of US strategic attention was not offshore, it was on the Central Front in West Germany. This is a reminder that the maritime-based geostrategic context of the competition with China is fundamentally different than that of the Cold War. US strategy fixated not on the system, but on deterrence, the Soviet threat and the balance of *military* power. The nuclear bomb also helped obviate the need for the United States to develop excellence in systemic management, economic and alliance diplomacy, and relating naval power with economic and political power to greater strategic effect.<sup>9</sup>

Since the Cold War did not demand competency in maritime thinking on the part of the US government, its leaders saw no need to demand the same of its navy.<sup>10</sup> Good or bad, the US Navy was free to define its purpose,

identity and fleet structure and did so around the style of warfare that had brought victory in its seminal experience – not the Battle of the Atlantic, but the power projecting-oriented Pacific campaign against Japan.

A maritime-based strategic outlook is well-suited to the interests of liberal states like the United States and Canada, the prosperity and security of which are dependent upon the vitality of the world economy and adherence to free market and democratic policies that have sustained economic prosperity thus far.<sup>11</sup> However, it has been the Chinese – the world's most avid readers of Alfred Thayer Mahan, the maritime historian and political economist – who have most readily grasped the need to think in maritime terms in an interdependent world.<sup>12</sup> The United States and its allies and their respective navies have a ways to go just to understand that need, and the implications of thinking in maritime terms to naval purpose and fleet recapitalization. 🍷

#### Notes

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## Capability and Capacity: All that Glitters is Not Gold

Vice-Admiral Sir Jeremy Blackham

The Royal Canadian Navy (RCN) is embarking on a program of 'recapitalization.' In old money, this seems to mean principally purchasing new ships (hereafter platforms) and, to a lesser extent perhaps, sensors and weapon systems, although of course the latter do not necessarily require new platforms to deploy them. More commonly though, it tends to be seen by politicians, media and citizenry as referring mainly to platforms because these are the 'headline items,' bright, shiny and expensive, the items that most visibly provide work and employment





Credit: BAE Systems

Computer generated image of the future Type 26 Global Combat Ship.

... and good short-term public relations for governments that are more interested in façade than substance. But my experience in the United Kingdom is that the concept has some potential pooh traps and I believe there are some important lessons to be learned from that experience and some warning signs to be recognized.

Of course, a steady rate of recapitalization under this definition is operationally sensible as technology and potentially hostile forces are also changing. It is industrially sensible too for it is important to keep the defence manufacturing industry alive, 'fed' and well-oiled if it is to be available and efficient when required, either in time of tension or conflict, or to replace as quickly as possible units lost in conflict. But unfortunately the word recapitalization also allows confusion to grow – dangerous confusion – and in the UK at least we can see the effect of this.

The difficulty lies in the difference between the theoretical potential of a new platform (which I shall call its *capability*) and what it can actually do in combat (which I shall call its *capacity*). It seems that the temptation to focus on the platform, the hull, itself, or the capability is simply too great for any politician to resist. We have seen a great deal of this in the UK with respect to the new carriers and the Type 26 Global Combat Ship, and even with the three (or is it five, who can keep track?) new but extremely scantily armed Offshore Patrol Vessels (OPVs). Much is being made of the physical presence of new platforms as if this is the answer to critics of the state of the Royal Navy.

But of course it isn't the answer; it's a delusion. The answer is to do with capacity, with what the platform is really able to do operationally. And *that* depends on a number of

things which I shall try to illustrate, using UK/Royal Navy examples. For instance, do the platforms being flaunted actually exist? The Type 26 is not yet even ordered, let alone the almost mythical Type 31. Is the shiny new platform fitted with adequate sensors and weapon systems? Adequate, that is, for the threat we might really have to face. Does it have the aviation capacity it is intended to carry? Although the new aircraft carrier will sail from the builder to Portsmouth in March 2017, the required number of aircraft have not yet been ordered and may not be available for another six years, even though the carrier program is now well over 15 years old. Is the necessary manpower available, with the necessary skills and initial and ongoing training? That is far from clear.

Do we have the right support and maintenance infrastructure, ammunition and stores availability to sustain a high operating tempo throughout the life of the platform? Britain has a generally unsatisfactory history in this regard; the Type 42 class ran out of its main weapon, its *raison d'être*, because the Sea Dart production line had been closed and the ships' life later extended. Can the platform's technology survive in a world where the length of technology generations is shrinking rapidly? Have we provided all the things demanded by the military lines of development? Doubtless we shall be told that we have, but in the light of past experience in the UK, a degree of scepticism is perhaps forgivable. One might even ask whether the cost of all this will result in the loss of other elements and force units which also contribute to capacity. All these thoughts seem to be relevant to other states' practices too.

I could continue with this litany but I hope that the point

is made. It is all the things I have just discussed that turn a potentially capable platform into a useful, usable and potent military capacity. Without them a platform is just that, a platform – a stage without players. The problem is that these issues are inherently less sexy. Worse, they are much less easy to understand for a political and social generation which itself has little or no experience of military service and little understanding of what is involved in pulling all this together in administrative, psychological and, not least, ongoing industrial capacity terms in a way that will last, not just for the platform's planned life, but for its actual life. Worst of all, dealing with them all is expensive, and may easily cost three or more times the cost of the platform over its life.

Credit: Brian Burnell



Type 45 air-defence destroyer HMS *Duncan* (D37) inbound to Portsmouth Naval Base, 17 June 2016.

Almost inevitably concern about all these non-sexy factors when a new and potentially exciting platform appears is likely to be seen as party pooping. It is a level of detail with which few government Ministers or journalists are going to tangle when confronted by the miracle, and the political kudos, of a new carrier. Few Ministers, or for that matter members of the public, care for an *aguafiestas*, someone who rains on their parade, for reasons they cannot or will not understand. We live, after all, in an era of denial, what some people are calling 'the post-truth era.' We live, I suggest, in an era in which people have become accustomed to prefer a glitzy and comfortable illusion to a dull, complex and perhaps threatening reality. We are not speaking about toys but serious weapons of war. We cannot afford to treat the matter trivially.

So what? Am I suggesting that we should not engage in recapitalization? Of course not. Everything has a life span and must be replaced, industrial skill and capacity must be retained and nurtured, technology must be adequate to compete against putative enemies in the real world, whose own capacity will not be standing still.

What I am suggesting is that the simple call for recapitalization is more complicated than it may at first appear. I'm suggesting that the wish to claim by simple and highly visible means a serious intention to improve force structures can easily lead to the overlooking of the critical importance of many of the vital elements of true military capacity. If that happens, and there are examples of it, then little will have been gained and governments may deceive themselves over their military and security capacity. I am sure that the RCN is well aware of all this but I hardly need to point out the dangers if its political masters are not. 🍷

### ***Tweaking the Procurement Approach for the Canadian Surface Combatant***

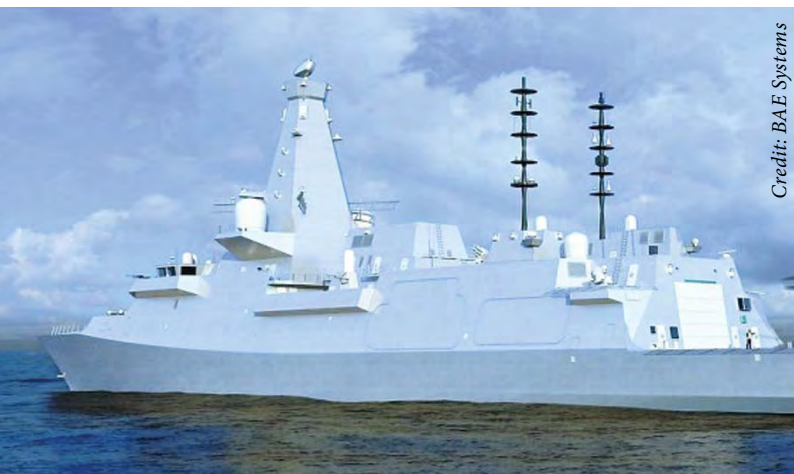
Captain Roger Chiasson, RCN (Retired)

In order to advance the process in the procurement of the Canadian Surface Combatant (CSC), the Canadian government recently (2 November 2016) announced a competition amongst existing proven designs. A Request for Proposals (RFP) has been issued to a dozen pre-qualified companies, mostly European. The RFP reputedly requires eye-watering detail from proponents, in an alarmingly short timeframe, with the winning designer and combat systems integrator to be selected in the summer of 2017.

Without a clear definition of 'proven design,' about the only assumption that can be made is that the responses will not have started from a clean sheet of paper and that, by virtue of past design effort, *some* cost and time savings will be gained over the traditional procurement process. Regardless, the end result is likely to be a hybrid ship, rather than a carbon copy of an existing (or in the case of the British Type 26 frigate, not-yet-built, therefore not-yet-proven) design.

There may have been other motives behind the government approach besides supposedly accelerating the CSC procurement process. Rather than select the best 'as-is' proven design that most closely meets the Statement of Requirements (SOR) specification, there was likely a desire to Canadianize the design (as we Canadians are wont to do with foreign procurements) and create at least an illusion of competition among the pre-qualified proponents. The mere act of pre-qualifying responders to the RFP has created enormous political risk to any change in approach. On the other hand, there is considerable media coverage of the shipbuilding industry's shock at having to respond to a complex RFP with an unreasonably short deadline. Among other risks, it is very likely that the deadline will be extended, or that the responses will lack the quality and necessary detail to allow selection of the most compliant





BAE's conception of the Type 26 Global Combat Ship.

and responsive company or consortium.

In addition, apart from the decision to acquire a proven design, the CSC approach is very much 'same old, same old,' and fraught with the usual risks. This means that the following will continue to be concerns:

- **Costs:** In spite of the apparent competition, hybrids of existing designs are not necessarily cheaper. This is because of the inevitable tradeoffs that are required to satisfy competing priorities, such as existing equipment and systems in the contending designs versus the need to score highly on the value proposition of the RFP.
- **Canadian industrial benefits:** Essential to successful military procurement is the economic spinoffs generated, both in labour and material, during initial procurement and post-delivery life-cycle support in the form of maintenance, logistics (spare parts) and training. Leaving state-of-the-art Canadian technology, such as the integrated platform management system and the integrated command and control system (CCS) to chance under the value proposition approach is tantamount to playing Russian roulette with domestic excellence and Canadian jobs.
- **Intellectual property (IP):** IP is vital to the RCN's unfettered control of the ship design throughout its life. There is considerable concern in the media that the procurement approach may jeopardise the navy's ownership, and, therefore, control of IP. The degree to which Canadian domestic equipment and systems do not make the value proposition cut is the degree to which the RCN's control of IP is jeopardised;
- **Schedule:** As previously stated, the current selection process and extremely optimistic deadline for

submission of proposals present a serious danger to the schedule, which in turn will affect the costs.

Warship design comprises two major components. The first component is made up of the platform systems. These include the physical hull, propulsion, electrical power generating and auxiliary machinery, and hotel services, such as accommodation, heating, ventilation and air conditioning, etc. The second component is made up of the combat systems. These include weapons, such as guns, missiles and torpedoes, sensors, such as radars and sonars, and communications equipment such as radios and satellite receivers. Essential in new ship designs is the level of systems integration both *within* each of these components and *between* the components.

Generally, the design of each system is conducted by two separate major contractors, with the shipbuilder being the prime contractor, and the CCS contractor as a major subcontractor. The relationship between these two players is usually strained, since they are interdependent during the integration and inevitable tradeoffs of the two designs.

### ***The RCN Legacy***

The Royal Canadian Navy (RCN) has become a master at incrementally extending the life and upgrading the capability of its warships, mostly due to lengthy gaps in new ship procurement. The 'Cadillac'-class steam destroyers of the 1950s and 1960s were based on the British Type 12 *Whitby*-class, with such innovative design features as bunks in lieu of hammocks, and improved nuclear fall-out protection through a pressurized citadel, rounded deck-edge forward and an installed pre-wet system against nuclear fallout. The original *St. Laurent*-class was progressively improved through subsequent flights of seven *Restigouche*-class, four *Mackenzie*-class and two *Annapolis*-class ships. These various iterations of the initial design incorporated such systems as helicopter decks, hangars and haul-down systems, variable depth sonars, the Canadian Electronic Warfare System (CANEWS) and the Automatic Data Link Plotting System.

The original seven *St. Laurent*-class ships were retrofitted as helicopter-carrying ships. Following the commissioning of the *Annapolis*-class in 1964, and throughout the ensuing decades until the arrival of the first Canadian Patrol Frigate (CPF) in the 1990s, the RCN's old steam destroyers were kept from rust-out in the 1980s by major refits. These included the Destroyer Life Extension project (DELEX), in which barn door-size steel plates were replaced, machinery was cycled through contracted repair and overhaul, and degraded capability was restored



A proven, baseline design for Canada's Canadian Surface Combatant? HMCS *Ville de Québec* in Montreal, 10 September 2016.

or improved through a number of weapons, sensor and communications equipment upgrades and such stand-alone projects as the Canadian Towed Array Sonar System.

The DDH 280 class, originally conceived as the repeat *Nipigon*-class, was similarly refitted and upgraded during the Tribal Update and Modernization Project (TRUMP), the main object of which was to add an anti-aircraft warfare capability to the fleet and an improved command, control and communications (C<sup>3</sup>) capability to better serve the task group command role.

The most recent example of the RCN's creative way to address the ever-decreasing half-life of technology and capability is the Frigate Equipment Life Extension (FELEX) project. Most of the FELEX components were focused on combat systems upgrades, but the platform systems also received timely improvements, most notably in the Integrated Platform Management System. Other platform systems and equipment were repaired or upgraded in the refit activity conducted concurrently with FELEX. These examples outline the RCN's impressive legacy, over half a century, of innovative, timely, incremental and affordable improvements to its warships.

### Proposal

No doubt the approach that the government has chosen for the CSC project will ultimately produce a SOR-compliant replacement for the Canadian Patrol Frigates, but there is one proven design that has not been recognized as a candidate.

Now is the ideal opportunity to define the recently-modernized CPF as the basis for the navy's Canadian Surface Combatant. It is proposed here that a *new* build of the existing CPF hull design be used as the basis for the platform design for several reasons. First, the CPF is considered a world-class design, with (at the time of its delivery) low infrared signature, low radar reflection and low waterborne noise performance. Second, the proven CPF platform detailed design (structural, piping, ventilation, cabling, etc.) is available, virtually without delay, to be duplicated or modified to incorporate changes

in machinery and equipment (i.e., equipment base plates, electrical cable and pipe runs, etc.). Digitizing existing drawings into 3D data (if not already complete) would greatly facilitate these relatively modest changes to the platform design.

Nevertheless, the existing platform system design – and likely any or all existing 'proven' designs – being solicited would/could require additional changes, such as:

- changes in technology and/or capability to the Integrated Platform Management System design to, as a minimum, integrate it with the new combat system as well as changes to individual machinery and equipment;
- incorporating a hull insert (commonly referred to as a 'plug'); a drawback of the CPF original design is the very congested machinery spaces. A new build would allow the insertion of a plug at mid-ships to relieve the congestion. A plug was considered for the second six ships in the CPF project but was not implemented.
- in lieu of, or in addition to the mid-ships insert, a plug forward of the superstructure could be accommodated for the installation of a 'missile farm' for area-air defence in an anti-aircraft warfare/task group command variant of the CSC.

Furthermore, the FELEX end state could be used as the baseline, and extrapolated through the CSC Statement of Requirements to meet technological and capability (response to future threats) requirements. As well, the combat systems integration contractor should be based in Canada, as was the case for the original CPF and FELEX designs. And, finally, proven and SOR-compliant Canadian-sourced equipment and their life-cycle support should be specified in order to minimize risk and to support Canadian industry excellence in niche areas.

### Conclusion

The probability, feasibility and likelihood of any change by the government in the procurement strategy for the CSC at this juncture is highly doubtful. However, the Canadian taxpayer, Canadian industry and the RCN will likely suffer the consequences of an ill-conceived procurement strategy and the failure to adopt a more cost-effective Canadian tradition of making the best out of meager financial resources when it comes to maintaining a blue-water navy.

The challenge is for the right consortium of existing proponents in the CSC solicitation to capitalize on the RCN's legacy of innovative pragmatism by proposing the CPF-centric solution and emulating the FELEX procurement model, thereby mitigating or eliminating the risks inherent in the current approach. 🍷



# *Dollars and Sense:* Adjusting to Trump

**Dave Perry**

Donald Trump's surprise election has introduced an element of uncertainty into Canadian defence policy. Through his campaign, Trump denounced often and with great vigour, those allies he said were not doing their fair share to provide for their common defence. In doing so, he even went as far as postulating that the NATO collective defence provisions might not be applicable for those allies shirking their fair share of spending. In Ottawa, the government is still coming to grips with the fact that it will not have the Hillary Clinton White House with which it expected to work.

Huge uncertainty remains about what Trump as President will do once in office. In his first month as President-elect he had already walked back or 'evolved' many of the commitments made during the election campaign. One thing is clear, though; his presidency will be different. From his tension with the mainstream Republican Party, to his policy proposals (such as they are), relationship with the media, and possibly even his residence, Trump has already demonstrated that we shouldn't assume it will be more business as usual.

That extends to national security and defence issues. The President-elect who mused openly about changing America's no-first use nuclear policy, changed the tenor of American-Taiwanese-Chinese relations with one phone call, and is already publicly feuding with the intelligence community over its assessment that Russia interfered in the American election, should not be expected to be aware of or accept the status quo. Neither should we expect this of the full roster of nearly 4,000 political appointees in the bureaucracy. On national security issues specifically, over 120 former Republican national security officials penned a 'Never Trump' letter protesting the idea of his victory. That, combined with the influence of outsiders like Steve Bannon, will mean that this administration will feature a far higher share of staffers from outside the traditional Republican mainstream than in the past. Trump picked the well-regarded General (ret'd) James Mattis as his nominee for Secretary of Defense, but the controversial Lieutenant-General (ret'd) Michael Flynn to be his National Security Advisor. It seems reasonable already to conclude that fewer than normal national security officials with the incoming administration will have experience with the way American national security has traditionally worked, and familiarity with traditional allied relations particularly.

This should concern Canadian officials because a lack of familiarity with the Canada-US defence relationship

combined with a clear perception that American allies need to do more to provide for their defence leave Canada vulnerable. Canada benefits from the American defence umbrella in a multitude of ways, yet does so as an easy rider when it comes to paying its share. Canada not only continues to fall short of its NATO spending targets (2% on defence and 20% of that spending on military equipment purchases), the trendlines aren't favourable either. Canada is currently 23<sup>rd</sup> of 28 member states on the share of GDP devoted to defence, and that percentage has declined in recent years. While Canada managed to fall under Trump's radar during the campaign, and wasn't singled out as one of the 'bad allies,' Canada should seize the initiative to make sure it is seen as a strong contributor to US defence.



Credit: Getty Images

*What will President Donald J. Trump's influence be on Canadian defence policy?*

That puts the onus on Canada to make its case to the new American administration. This increases significantly the importance of the Defence Policy Review slated for release some time early in 2017, as it will be one of the first major signals to the Trump administration about what kind of ally Canada is. One major signal will be financial. Quite simply, if the Americans see either a reduction to defence spending or even status quo funding, that will not do much to convince them Canada is serious. While it's unrealistic to expect that Canada will come anywhere close to the 2% target (since spending has now fallen to 0.99% of GDP), Canada would be wise to start moving in that direction.

The best way to approach that, and address Canada's own defence priorities would be to direct efforts towards



The North Warning System station in Cambridge Bay, Nunavut, is part of the joint Canada-US air defence radar network, 13 April 2015.

reaching the target of 20% of overall defence spending for equipment expenditures. According to the NATO metrics, Canada has been floating between 11 and 15% spending in this category in recent years. Roughly \$1 billion annually, if introduced over two to three years, would get Canada most of the way to that target, and also move defence spending towards the overall 2% of GDP target. An additional \$1 billion (for a total of \$2 billion) phased in slowly over time afterwards would close the current Department of National Defence (DND) funding gap for capital equipment. In either scenario, significant improvement to Canada's procurement system will also be required to make effective use of the funds available.

Beyond the money, in conjunction with the policy review, Canada should bring forward proactively some options on the key continental defence issues that matter to the Pentagon. These include modernizing the North American defence command and control arrangements, especially NORAD, and upgrading and modernizing the North American defence infrastructure. Given changing technologies and emerging threats, the Americans want to change the NORAD construct to expand it beyond aerospace warning and response and maritime warning, to position it to deal better with threats in other capability domains. So far, this dialogue seems to be largely American driven. Canada should bring forward its own proposals for how to address the evolving security situation in a way that best suits its own interests.

Regarding defence infrastructure, the system built primarily off of the North Warning System is in need of modernization. That constellation of early warning radars

across the North American north was oriented towards a now outdated threat of slow moving, highly detectable Soviet bombers that needed to approach close to North American territory to present a real threat. Following extensive Russian military modernization, those same aircraft now carry long-range, precision-guided cruise missiles that can be successfully fired at much longer distances. The existing system therefore needs to be replaced with something new to counter the air threat, and have it form part of a systems-based approach to defending the continent against all perils. The Americans are keen on having the replacement to the North Warning System also contribute to the defence against ballistic missiles and having this fully integrated into NORAD. The pressure is therefore on the Justin Trudeau government to change previous Canadian policy. If it will not, then Canada needs to be innovative in proposing work-around solutions to the Americans.

Finally, the issue of how these continental defence enhancements are funded is worth some careful thought as well. Historically, projects like the North Warning System were funded by both governments, even if located on Canadian soil. Ottawa should give some consideration to offering to pick up a larger share of the tab on some aspects of the proposed changes. Proposing that Canada underwrite a larger than planned share of the funding for the research and development projects needed to examine options for enhancing continental defence arrangements would be a good indication that Canada is a serious ally.

In sum, Canada should get out ahead of Trump. 🍷



# Warship Developments: Aircraft Carriers: Today's Dreadnoughts?

Doug Thomas

In 1906, the Royal Navy commissioned HMS *Dreadnought*, the first all big gun, steam-turbine-propelled battleship. At a stroke, every other battleship became obsolete – including those in the British fleet. A new arms race was immediately precipitated, and many countries wanted *Dreadnoughts* (as this type of ship became known) in the years leading up to World War I. To a state of medium size or larger, having one or more of these impressive ships was necessary to 'keep up appearances' and match the capabilities of other navies of its region. An example was the naval rivalry among Argentina, Brazil and Chile.

Today's prestige acquisition is the aircraft carrier, especially those capable of projecting power ashore from the sea. One might argue that it is the nuclear-powered submarine, but it is difficult to make a visible statement about the importance of your country with a relatively small, albeit immensely capable, vessel if it is submerged most of the time. Also, it is difficult to hold a good diplomatic reception or cocktail party in a submarine!

The Indian and Chinese carrier programs have been discussed in *CNR* before so we know that it takes many years to stand-up an operational aircraft carrier capability – even if the ship is built abroad. These countries are nuclear powers and see the carriers as prestige vessels necessary to establish their status in the world, rather like

possession of *Dreadnought* battleships a century ago.

India is building a large modern navy with force-projection capabilities in the Indian Ocean, with an eye to the buildup of the Chinese Navy. The Indians have an advantage over China in that they have operated aircraft carriers since the early 1960s. First they operated the ex-British light fleet carrier *Vikrant*, which was very similar to Canada's *Bonaventure*, and then the larger ex-HMS *Hermes* (INS *Viraat*) launched in 1944 and acquired by India from the Royal Navy in 1987, which has finally been laid up and will be formally decommissioned in January 2017. A new Indian-built *Vikrant* of about 40,000 tons is nearing completion. It is similar in appearance to the refitted INS *Vikramaditya* (ex-Russian modified *Kiev*-class *Admiral Gorshkov*) but with modular construction and gas-turbine propulsion. A larger, indigenous-built carrier is planned for commissioning in the mid- to late 2020s, with the intention of maintaining a force of three aircraft carriers, two will be operational and the third in refit at any given time.

The Indian Navy today ranks as the world's fifth largest, and continues to grow. By 2019, it will comprise over 150 ships and about 500 aircraft and helicopters. New programs include an expansion of its third and latest naval base INS Kadamba on the Arabian coast, with facilities for basing 50 ships, including the latest aircraft carriers. Its carriers,



India's largest and first indigenously-built, 40,000 tonne aircraft carrier, named INS *Vikrant*, at a ceremony held at the Cochin Shipyard Limited in Kerala, India, 10 June 2015.

Credit: Indian Navy/Wikimedia Commons



Credit: AFP/Getty Images

**Liaoning**, China's aircraft carrier, sails during military drills in the Pacific, 24 December 2016. Shortly thereafter, the carrier and a flotilla of other warships traveled through the Taiwan Strait.

nuclear-powered submarines, amphibious vessels and modern offensive and defensive missile systems all signify that it is a well-rounded and increasingly capable force.

The Chinese Navy (People's Liberation Army (Navy) or PLA (N)) has been considering an aircraft carrier capability since the 1980s, and actually purchased three retired carriers: the ex-HMAS *Melbourne* (similar to HMCS *Bonaventure*) and two ex-Russian *Kiev*-class carriers. The ships were studied very thoroughly for lessons that could be learned and applied to their national program.

The Chinese aircraft carrier *Liaoning*, ex-Russian/Ukrainian *Kuznetsov*-class carrier *Varyag* – purchased as an incomplete stripped hull from Ukraine in 1998 and completed as a training carrier in 2011 – is unlikely ever to be a truly operational carrier by Western standards. It is likely to be a step en route to a capability to operate carriers. Nevertheless *Liaoning* would present an imposing presence to smaller countries in the region, and she has operated jet fighter aircraft in trials and exercises. The ship was acquired with a complete set of blueprints, and there are now two new carriers under construction at Dalian Shipyard, where *Liaoning* was rebuilt and completed.

The new Type 001A carriers are expected to be essentially *Kuznetsov*-class carriers, built using the acquired blueprints and reverse-engineering from *Liaoning*. It is likely that the propulsion system will also be oil-fired steam rather than gas turbines, but they will be fitted with modern electronics and weapon systems, primarily from domestic suppliers. An Achilles heel of these vessels, as well as the Indian carriers, is the Short Take-off But Arrested Recovery (STOBAR) system for operating aircraft. The modified land-based air force fighters (with strengthened airframes and landing gear) operated by both the Indian and Chinese carriers – at least in the near future – will not be launched from catapults but will employ a ski-jump to

achieve the speed and lift necessary to become airborne. This limits the quantity of fuel and/or weapons that can be carried, and the radius of action of these aircraft is greatly reduced compared with catapult-launched aircraft such as the American F-18 E/F Super Hornet.

Both China and India now possess far more than just an aircraft carrier. Their well-rounded fleets include all the components necessary to form carrier battle groups: i.e., powerful task groups composed of one or two aircraft carriers with replenishment vessels, area-air defence, surface and anti-submarine warfare destroyers and frigates, nuclear and diesel-electric submarines, amphibious and mine-warfare vessels and a range of fixed-wing aircraft and helicopters, so that the capabilities of the task group can be tailored to fit the mission.

### Conclusions

There is no doubt that India and China are both developing world-class navies, and that in the future we will see them operating carrier battle groups capable of area-sea control and projecting power ashore. Particularly in the case of the Chinese Navy, such operations in the South China Sea will pose a threat to neighbouring states. It is likely that follow-on larger carriers in the range of 60,000-70,000 tonnes, to be commissioned in the mid- to late 2020s, will be fitted with catapults, either steam or perhaps a version of the new Electromagnet Aircraft Launch System (EMALS) going into the US Navy's *Ford*-class, which is much lighter, more compact and reliable than earlier systems. Catapults would greatly increase the capability of these navies to operate aircraft with longer 'legs' and heavier weapon loads.

The world order is changing, and it will be necessary for strategists to weigh carefully the existence and significance of Chinese and Indian carrier battle groups when considering operations in the western Pacific and Indian Oceans in the coming decades. 🍵



# Book Reviews

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*Against the Tide: Rickover's Leadership Principles and the Rise of the Nuclear Navy*, by Rear-Admiral Dave Oliver, USN (Ret'd), Annapolis, MD: Naval Institute Press, 2014, 179 pages, \$27.95 (hardcover), ISBN 978-1-61251-797-1

Reviewed Colonel P.J. Williams

Truth be told, there's likely a bit of Admiral Hyman Rickover (also known, perhaps ironically as the 'Kindly Old Gentleman' to crews of US nuclear-powered warships) in all of us. From time to time, we've probably all been in a situation where we were trying to advance an idea, which we knew was right, in the face of fierce opposition, whether real or imagined. And we met with success, or not, to varying degrees. Certainly no one can deny that the late Admiral Rickover, the so-called 'Father of the (US) Nuclear Navy,' believed he was right and indeed a good case can be made that in fact he was. The most potent warships in the US arsenal – its aircraft carriers and submarines – are nuclear-powered, and have been so for decades, largely thanks to his foresight and persistence. The subs in particular, in the author's view, proved to be the key military capability which effectively won the Cold War.

Dave Oliver's aim in writing this book is, in his words, "to offer a perspective on the admiral's leadership" (p. 3). He goes on to state that he is describing Rickover's management style, which many would say is not exactly the same thing. The book is organized so as to use vignettes from various stages of Admiral Rickover's career, including those in which the author was involved. At the end of each chapter, having used such anecdotes to bring out a specific lesson, the author then questions readers as to whether their own organization or leadership style embodies the principle just illustrated.

This book is not, and does not claim to be, a scholarly work. The author writes with an easy, sometimes folksy style which is well suited to this kind of work. Clearly having served as (because he was chosen by Rickover) a submarine commander under the Admiral, he retains much admiration for his subject. Most chapters are introduced with a quote from Admiral Rickover, and the author's many encounters with Rickover over the course of his career are used to illustrate the leadership principles espoused in the title. In many ways there is nothing new here as these principles number among them foresight,

accepting correction, flexibility of mind and loyalty to top-performing subordinates. The author distills these down to three key lessons:

- hard work and focus can succeed for anyone;
- humans can manage process control as well as continuous change at the same time; and
- an extraordinary leader can see well 'beyond the horizon' (p. 118).

Rickover remains the longest-serving naval officer in US history with 63 years active duty, and for almost half of this maintained control over the selection of nuclear submarine commanders and engineering officers. Stories of his interviews with prospective members of 'his program' are legendary. If he'd been in the Canadian Armed Forces, he would have been entitled to five clasps to his Canadian Forces Decoration! His legacy lives on in the two submarines which have been named after him as well as Rickover Hall at the US Naval Academy, where it is said that science students rub the nose of the bust of Admiral Rickover, outside the hall, for good luck before an exam. Despite his influence, which is felt to this day, the story of Admiral Rickover is somewhat of a cautionary tale and he was eventually forced to retire under the administration of President Ronald Reagan, after a somewhat stormy meeting with the President, the Secretary of Defense and the Secretary of the Navy.

After reading this I wondered if Canada could ever produce such an officer. Certainly the way in which Canadian senior military leaders engage with the highest levels of government is different. Canada is a parliamentary democracy while the United States is a republic, and in the United States the legislative branch (Congress) is sometimes more important to cultivate than the Executive (the White House). That said, the story of Rickover and how he made the US Navy into what it is today offers valuable lessons, not only on the need for technical competence in capability development but also in civil-military-relations. While Canada may not have ambitions to make its warships nuclear-powered, how the Kindly Old Gentleman was able to win the support of those who enabled him to make the nuclear navy a reality, might usefully inform our own discussions on future capabilities such as the F-35 Joint Strike Fighter and cyber-warfare, or indeed defence renewal. As such, this book is recommended for senior defence leaders, especially if they think they're right. 🍷

*Canada's Bastions of Empire: Halifax, Victoria and the Royal Navy, 1749-1918*, by Bryan Elson, Halifax: Formac Publishing, 2014, 277 pages, 1 appendix, index, ISBN 978-1-45950-326-7

Reviewed by Joe deSapio

Although Bryan Elson's book is ostensibly about the naval bases and fortifications of both Victoria and Halifax, its major appeal stems from the way in which the local histories of these places are seamlessly inserted into the wider imperial relationship between Canada and Great Britain. Elson's belief that the questions and debates of empire had real impact on the Canadian coasts is well-founded; there is a remarkable parallel between the Halifax and Esquimalt naval dockyards searching for a role after the British handover with that of the Canadian experience, similarly finding a new footing that was neither entirely independent from British ties, nor too firmly attached for political reasons.

*Bastions of Empire* demonstrates that when it comes to Canadian politics and policies, continuity reigns supreme. The haphazard and inconsistent manner in which both the Royal Canadian Navy (RCN) and militia are incorporated, financed and fielded between 1871 and 1914 speaks volumes on the ubiquity of the 'hurry up and wait' nature of Canadian defence politics, as the English-French compromise and the presence of the 'Militia Myth' cloud a unified approach until war is near – a trend repeated throughout the conflicts of the twentieth century. Furthermore, this internal discord was often mirrored by tensions between British expectations and Canadian realities, as well as the looming presence of the United States to the south. *Bastions of Empire* shows a maturing and evolving Canada attempting to chart its own course among these political shoals.

Elson also knows when to ignore the larger relationship in favour of smaller, piecemeal events which draw Halifax or Esquimalt (or Victoria or Sydney) into wider events. The story of Victoria emptying its jail to provide labour for a hasty refit of HMCS *Rainbow*, for instance, shows brilliantly just how underfunded and perilously close to collapsing the early RCN actually was.

This story is, however, laid out in an inconsistent fashion. The first half of the book's eight chapters are devoted to a quick examination of the 160-year historical relationship underpinning the developments of Halifax and Victoria (and, by extension, the RCN). The remaining four chapters focus on the months from August to December 1914. It seems an abrupt conclusion to these places' stories – surely the successful prosecution of WWI would have

been a more fitting evolutionary capstone, and a signal that Canada had matured into a capable and independent state.

Present in the background of Elson's work is an interesting argument on the nature of imperial defence and the RCN. Focused on domestic policies such as the National Policy or transcontinental railway, most Canadians turned a blind eye to defence matters. It became necessary for both the militia and fledgling navy to build themselves a public presence – to 'show the flag,' in modern terms – especially in interior or rural areas. Defence spending on improving Halifax or Esquimalt was not always a priority unless the military could be shown to be an indispensable part of Canadian life. Indeed, during the Reciprocity debates of 1910-11, the old fears of American annexation of Canada resurfaced, the same period which saw the establishment of the Canadian Naval Service. While not a clearly causal relationship – the German threat provided better motivation for naval endeavours – the necessity of having a functioning and capable military was nevertheless demonstrated as a precursor to total sovereignty.

Ultimately, Elson has crafted a readable and engaging narrative of an understated, yet formative period in Canadian history. In the years between 1907 and 1914 (and indeed, 1918) Canadians evaluated their place within the larger British Empire, examined their self-identity, and then resolutely embarked on a path of continued independence. 🍷

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*A Historical and Legal Study of Sovereignty in the Canadian North: Terrestrial Sovereignty, 1870-1939*, Gordon W. Smith, edited by P. Whitney Lackenbauer, Calgary: University of Calgary Press, 2014, 512 pages (Trade Paper) CAD \$39.95, ISBN 978-1-55238-774-0

Reviewed by Colonel (Ret'd) Brian K. Wentzell

This voluminous work by the late Gordon W. Smith has been published by his literary executors, Tom W. Smith and Nell Smith, with the able editorial assistance of P. Whitney Lackenbauer. Gordon Smith devoted most of his life to the study of the issues of Canadian Arctic sovereignty, from both national and international perspectives. This book is the first volume of his previously unpublished works. It is a comprehensive study spanning seven decades. The material has been thoughtfully organized by Professor Lackenbauer and, despite some inevitable repetition, flows well.

The study chronicles the political history of the Canadian



Arctic from the earliest transfer of authority from Great Britain in 1870 to the 1942 voyage of the RCMP ship *St. Roche* through the Northwest Passage and onward to Halifax, Nova Scotia, where she arrived on 11 October 1942 under the command of Henry Larsen. At the time, the government of Canada was concerned about challenges to its authority in the Arctic, particularly by Denmark, Norway and the United States.

The true extent of the Arctic lands was unknown in 1870. Only careful exploration and mapping could better define its full extent. Canada was a very young country with many pressing issues upon which to focus in its expansion westward through the continent. Thus, the resources available to exercise sovereignty in the mostly uncharted north were meagre at best. However, the federal government did pay attention to the need to explore and document the full extent of the northern archipelago, the Inuit people, the vegetation, animals, mammals, birds and fish in the region. This was accomplished over the seven decades in a reasonably methodical fashion, as financial and other resources permitted.

A key part of the exercise of sovereignty was the application of Canadian laws to those who inhabited or transited the territory. The RCMP, Department of Marine and Fisheries, and the Department of the Interior, later reconstituted the Dominion Lands Administration, were the main agencies involved in exercising sovereign rights. This was important as American and European whalers, hunters and explorers were known to frequent Canadian Arctic waters and islands and paid little attention to compliance with Canadian laws.

International law was another facet of the challenge to sovereignty. Visits by private explorers did not necessarily give rights of claim or ownership to the country of their citizenship. Proclamations by government-sponsored explorers provided some authenticity to sovereignty claims, however, these were not usually accompanied by continuous occupation or use.

Some legal clarity came about through the decision of the Permanent Court of International Justice that resolved a dispute between Norway and Denmark over the ownership of eastern Greenland in 1933. The court ruled that a claim of sovereignty, to be valid, must be “based not upon some particular act or title such as a treaty of cession but merely upon continued display of authority, [that] involves two elements, each of which must be shown to exist: the intention and will to act as sovereign, and some actual exercise or display of such authority” (p. 317).

The Danes had occupied the east coast of Greenland from 1894 and no country physically challenged its claim

until 1921. Finally, in 1931, the Norwegian government proclaimed sovereignty over a part of eastern Greenland. The court held that the Norwegian act “did not make out a superior claim” to that of Denmark (p. 317). Denmark had exercised sufficient authority over Greenland from 1814 to 1915 to confer a valid title to the sovereignty (p. 318).

Thus, the acts of authority exercised by Canada, dating from the original transfer of the northern territories from Great Britain in 1870, conferred a valid title to the Dominion. Although title to some islands in the archipelago might have been open to challenge, Norway, Denmark or the United States could not demonstrate a superior claim to any islands or portions thereof. In short, Canada had used its Arctic lands and therefore could not lose them.

The analysis of Gordon Smith in this first volume does not extend to the issue of international straits as none then existed. Perhaps a subsequent volume will provide a depth of analysis that will help solve that increasingly important issue.

I strongly recommend this present volume to all Canadians and others interested in issues of Canadian sovereignty in the Arctic. 🍷

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*Relentless Strike: The Secret History of Joint Special Operations Command*, by Sean Naylor, New York: St. Martin's Press, 2015, 544 pages, maps and photographs, Cdn \$34.50, ISBN 978-1-25001-454-2

Reviewed by David A. Beitelman

The recent wars in Iraq and Afghanistan are historically significant for a variety of reasons. For military historians, one important feature of the US engagements will certainly be the dominant role played by US Special Operations Forces (SOF). In *Relentless Strike*, defence journalist Sean Naylor has offered a comprehensive history of the military command at the forefront of US SOF, the Joint Special Operations Command (JSOC). The true tip of the spear, JSOC oversees the most elite units, including the Army's 75<sup>th</sup> Ranger Regiment and Delta Force, the Navy's famed SEAL Team 6, and a host of other intelligence and aviation special mission units. From the JSOC's beginnings in the aftermath of the failed mission to rescue American hostages in Iran in 1980, through to the fight against the Islamic State in Syria and Iraq today, Naylor shines a light on the shadowy world of clandestine, covert and special operations carried out in all corners of the world.

Relying on a bevy of mostly anonymous sources, Naylor does a wonderful job of weaving history and investigative

journalism into a cohesive, and compelling, narrative. And at over 500 pages, the pace Naylor sets is itself 'relentless.' For those looking to satisfy their inner spy, there is plenty of intrigue and suspense. Indeed, the book is like peeling the layers of an onion – for every revelation, there are hints of other, more interesting stories that Naylor leaves alone. For instance, there is the revelation and occasional mention of the use of female operatives working for Delta Force and SEAL Team 6. There are stories of single operators sent on missions in non-permissive environments like Iran, their identities and missions kept secret from all but a few senior officers within JSOC. The point Naylor drives home is that in the world of black operations, even the shadows have shadows.

But more than just a chronological history or collection of stories of daring and bravado, it is a story of adaptation under pressure. When the wars in Afghanistan and Iraq began in 2001 and 2003, respectively, JSOC, then under the command of Major General Dell Dailey, was bulky, requiring a large support staff to deploy on every mission. The premier special mission units within the command, like Delta Force, were rarely used, much to the chagrin of their operators. It was, as Naylor phrases it, like having a Ferrari kept in the garage. As the nature of American wars changed and the country's enemies increasingly became networks of insurgents and terrorists rather than uniformed soldiers, JSOC took on a transformative role. The command changed and with it the way the United States fights its wars.

*Relentless Strike* is also a story of leadership and martial innovation. General Stanley McChrystal, who led JSOC for a record-setting five years (as opposed to the traditional three), is credited with transforming JSOC into a nimble, aggressive and devastatingly lethal force – more so than it had already been. To target networks of enemies, McChrystal adapted JSOC into a network of its own, with greater intelligence sharing and joint operations than had previously existed. The operational tempo under McChrystal increased to a level that almost defies belief, with units striking multiple targets per night, where before they only conducted a handful a month. Find-Fix-Finish became the new mantra – identify the targets, find their location and kill or capture them.

Underlying the importance of leadership is a story of military culture. Commanders of JSOC are usually veterans of its composite units. McChrystal, for example, was an Army Ranger. General Dailey served in the Army's 160<sup>th</sup> Special Operations Aviation Regiment – the Night Stalkers – home to the US military's best pilots, particularly known for their helicopter skills. The history of the commanders plays into their leadership style, which composite units

they are perceived to favour, and how risk-averse they are. McChrystal's successor, Admiral William McCraven, a former Navy SEAL, planned and oversaw the operation that killed Osama bin Laden – an operation carried out by the Naval Special Warfare Development Group, also known as SEAL Team 6. The unit was selected to carry out the bin Laden mission because of mundane operational divisions which meant the SEALs cover Afghanistan while the Army's Delta Force covers Iraq. However, many within JSOC felt that if McChrystal had been in charge at the time, the mission may have been given to Delta Force.

*Relentless Strike* is a book that tells many different stories in the process of telling the singular history of one command. It is a detailed chronological retelling of the last 30 years of American shadow wars. It is a story of the bravery and dedication of the men and women who comprise the JSOC units and their experiences in combat around the world.

It is also a study in military innovation, adaptation, leadership and inter-service tribalism. There is even the occasional mention of Canadian operatives for those looking for stories closer to home. It is rich in detail, carefully researched and sourced. Indeed, there is a surprising tension between Naylor's use of names and his reference to anonymous sources. (Several of those named in the book, like former Delta Force operator Brad Taylor, took exception to being 'outed' by Naylor, even though Taylor himself is an established fiction writer who has made no secret of his military career.) Anyone interested in military history, special operations, the wars in Iraq or Afghanistan, or the peripheral combat zones that fill today's headlines, should read this book. *Relentless Strike* is an instant classic. 🍷



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# 2017 Canadian Naval Memorial Trust Essay Competition

*Canadian Naval Review* will be holding its annual essay competition again in 2017. There will be a prize of \$1,000 for the winning essay, provided by the Canadian Naval Memorial Trust. The winning essay will be published in *CNR*. (Other non-winning essays will also be considered for publication, subject to editorial review.)

Essays submitted to the contest should relate to the following topics:

- Canadian maritime security;
- Canadian naval policy;
- Canadian naval issues;
- Canadian naval operations;
- History/historical operations of the Canadian Navy;
- Global maritime issues (such as piracy, smuggling, fishing, environment, human migration via the sea);
- Canadian oceans policy and issues;
- Arctic maritime issues;
- Maritime transport and shipping.

If you have any questions about a particular topic, contact [naval.review@dal.ca](mailto:naval.review@dal.ca).

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## Contest Guidelines and Judging

- Submissions for the 2017 *CNR* essay competition must be received at [naval.review@dal.ca](mailto:naval.review@dal.ca) by **Monday, 12 June 2017**.
- Submissions are not to exceed 3,000 words. Longer submissions will be penalized in the adjudication process.
- Submissions cannot have been published elsewhere.
- All submissions must be in electronic format and any accompanying photographs, images, or other graphics and tables must also be included as a separate file.

The essays will be assessed by a panel of judges on the basis of a number of criteria including readability, breadth, importance, accessibility and relevance. The decision of the judges is final. All authors will be notified of the judges' decision within two months of the submission deadline.



BAE's conceptual design for its proposed Type 26 Global Combat Ship. The Type 26 is also an entrant in the Canadian Surface Combatant design competition.

*Credit: BAE systems*